

New Hampshire Rivers Management and Protection Program

RIVER NOMINATION FORM

LAMPREY RIVER IN LEE AND DURHAM, N.H

I NOMINATION INFORMATION

A. Name of River: Lamprey River

B. River Segment: 9.5 miles (approx.), from the Lee /Epping border, through Lee and Durham to the Durham/Newmarket border.

C Sponsoring Organization: Lamprey River Watershed Assoc.

Contact Person: Judith Spang

Address: RFD 1, Wiswall Rd., Durham, N.H. 03857

Phone Number (daytime): 659-5936

We feel the Lamprey River is worthy of protection for several key reasons:

- 1) It is a major tributary to the Great Bay, and as such has a significant impact on the Bay's water quality, and is a natural extension of its wildlife habitat. Great Bay's national importance was recently recognized through its designation as a National Estuarine Research Reserve.
- 2) The large proportion of undeveloped land on the Lamprey makes it a valuable resource in terms of its scenic beauty and its value as a wildlife habitat.
- 3) The Lamprey's high water quality translates into a major regional recreational resource. Fishing, swimming and canoeing are extensive on the river. The river is also Durham's reserve public water supply.
- 4) Community support for protection of the river is high, with almost two-thirds of the shoreland owners requesting designation of the river as a national Wild and Scenic River.

Planning for protection and management of the Lamprey has been underway since 1983, when the Strafford Regional Planning Commission completed the Lamprey River Management Plan (submitted with this nomination). The Lamprey River Watershed Association has been represented in groups working to protect the river through new zoning ordinances and acquisition of easements in both towns

II. SUMMARY: RESOURCES OF STATEWIDE OR LOCAL SIGNIFICANCE

A. In order to be eligible for designation to the New Hampshire Rivers Management and Protection Program, a river/segment must contain or represent either a significant statewide or local example of a natural, managed, cultural or recreational resource. By checking the appropriate boxes below, indicate the resource values that you believe are present in this nomination. Which statement best typifies current conditions?

	Value Present and of Statewide Significance	Value Present and of Local Significance
NATURAL RESOURCES		
Geologic Resources	X	X
Wildlife Resources	X	X
Vegetation/Natural Communities	X	
Fish Resources	X	X
Water Quality	X	X
Open Space	X	X
Natural Flow Characteristics	X	X
Scenic Resources	X	X

MANAGED RESOURCES

Impoundments		X
Water Withdrawals/Discharges		X
Hydroelectric Resources	X	

CULTURAL RESOURCES

Historical/Archaeological	X	X
Community River Resources	X	X

RECREATIONAL RESOURCES

Fishery	X	X
Boating	X	X
Other Recreation		X
Access		X

B. Briefly describe the most important resource values which are present and why you believe the values are significant from either a statewide or local perspective. For example, if a significant statewide recreational resource is present, identify the type and location of the resource and explain why you believe it is of statewide significance. If you feel the value is threatened, explain why.

NATURAL RESOURCES

1. Wildlife Resources- Statewide: Of *Statewide* significance are the bald eagles and osprey believed to be nesting near the river, but certainly using it for feeding; and a heron rookery (of Statewide significance) in a large beaver marsh adjoining the river in Lee. In all, there are 5 Critically Imperiled species of birds, and 22 Imperiled or Rare species of mammals, reptiles, amphibians and birds in the river corridor. (Two lists attached.) Threatened by habitat loss from future land development.
2. Vegetation/Natural Community: Statewide: The diversity of unspoiled land (woods, fields, extensive wetlands and relationship to Great Bay) create a rich habitat for 235 species of birds, mammals, reptiles and amphibians, butterflies and moths. The Lamprey is also an important wildlife travel corridor. (See Ad Hoc report, attached.)
There are 85 species of trees and bushes, and 6 species of rare or endangered plants along the river.
The extensive river wetlands also serve as flood storage and water filtration for the lower Lamprey communities.
Threatened by continued desirability of shorefront for residential development.
3. Fish Resources - Statewide: The Lamprey River has been named by the General Court as the state's most significant resource for anadromous fish. Shad, alewives and Chinook salmon run to the Wiswall dam. In addition to the trout stocked by Fish and Game (rainbow, brook and brown), large- and small -mouth bass are native to the river.
4. Water Quality- Statewide: The Lamprey's water quality is high. This has two important ramifications: Recreation (the river is a heavily used regional recreational resource); and impact on Great Bay. Degradation in water quality of the Lamprey would have a severe impact upon the environmentally threatened Great Bay, of which it is a major tributary. (Great Bay has just been designated a National Estuarine Research Reserve System: a federal effort to preserve an estuary of national importance.)

Potential threats to water quality would be from individual septic facilities, any failure of Epping wastewater treatment plant and potential impact of hydro operation at the Wiswall dam (Water Quality certificate still under study.)

5. Open Space and Scenic Resource- Statewide: The Lamprey is on the National Inventory of Potential Wild and Scenic Rivers, and is now in the process of acquiring study status under that program. With little exception, the riverfront is unspoiled woodland or fields (about 15 miles of undeveloped riverfrontage). Threat of development is significant not only because of the strong market for shorefront land, but because many of the farmers who own the open land are reaching retirement age.

MANAGED RESOURCES

6. Impoundments: Local. The Wiswall dam is used for flood control. The impoundment enhances recreation above the dam.
7. Water Withdrawals: Local: "Emergency" public water supply for the town of Durham (connected to water treatment facility.)
8. Hydroelectric Resources: Potential National: 2 active license applications on Wadleigh Falls and Wiswall Falls.

CULTURAL RESOURCES

9. Historical/Archeological- Statwide and Local: The Wiswall Falls 19th century mill site is on the National Register of Historic Places, and is of Local significance. The Wadleigh Falls prehistoric site, dating back 8,500 years, is of Statewide importance. Both the Wiswall and Wadleigh sites would be affected by development of either dam for hydroelectric facilities, being proposed either directly atop or abutting the archeological sites.
10. Community River Resources: National and Statewide: Recreationists (fishing, canoeing) from throughout New England use the Lamprey. The river has been proposed for National Wild and Scenic River study status (on National Inventory of Potential Wild and Scenic Rivers.) Lamprey River Management Plan prepared by Strafford Regional Planning.

RECREATIONAL RESOURCES

1. Fishery: Statewide. Anadromous fish restoration, heavily fished
2. Boating: Statewide See quotes from AMC Canoe Guide.
3. Other Recreation: Statewide: Heavily used by organized skimobile clubs, commercial sculling, skiing, swimming, etc.
4. Access: Local. Three Town-owned properties, other access is informal or negotiated with private landowners.

III COMMUNITY/PUBLIC SUPPORT

At present the towns of Lee and Durham are attempting to introduce this stretch of the Lamprey for study status under the National Wild and Scenic Rivers Act. In support of this, 90% of the riverfront owners in Durham, and almost 50% in Lee, together accounting for 11 miles of riverfrontage, have petitioned the U.S. Congressional delegation. The Lee Selectmen and Durham Town Council have passed resolutions of support. There were also over 50 additional non-owner petitioners.

Goals of the 1989 Durham Masterplan include: "maintain and acquire green belts along both the Oyster and Lamprey Rivers for use as a trail system, where appropriate"; and "Establish a watershed overlay protection zone along rivers serving as existing and potential domestic water supply." The latter refers to the Lamprey, which is also part of Newmarket's back-up water system downstream. The Lamprey is identified in the Masterplan map as a Conservation Corridor. (Excerpts from Masterplan attached.)

The Lamprey River Watershed Association, the sponsor of this nomination, has been working with Conservation Commissions along the Lamprey to develop complementary zoning to protect the river. Individual members have been active in soliciting a growing number of landowners interested in selling or donating easements along the Lamprey.

IV OTHER SUPPORTING INFORMATION

A. Visuals (maps, slides)

Photographs and an audio-visual presentation will be submitted at the RMAC meeting. Annotated maps on both hand-out and presentation scale will be provided, indicating: location of significant resources on the river ("The Lamprey River, Lee and Durham, N.H."); Land Use; and "Lamprey River Geological Resources" (prime agricultural soils, important sand and gravel deposits, and waterfalls); and the Durham Masterplan's "Future Land Use Plan".

B. Appended Reports and Inventories

Reports include: relevant sections of the Strafford Regional Planning River Management Plan for the Lamprey; copies of the Durham Masterplan and both town's Zoning relating to the River; town resolutions regarding Wild and Scenic designation; lists of wildlife and botanical species found in the corridor, with endangered species noted; portions of the AMC Canoe Guide to N.H. and Vermont describing the Lamprey; and historical reports on the Wadleigh and Wiswall falls sites, with a historical summary of the Lamprey prepared by the Watershed Association.

V RIVER CLASSIFICATIONS

Most of the river is Natural, although the segment with structures close to the water and the impoundment of the Wiswall dam would better meet the Rural classification.

- a) The segment is **over 5 miles** (just under 10 miles.)
- b) Existing water quality is **Class B**.
- c) The only places (aside from the four bridges) where the road is not completely screened and closer than 250' to the river is 100 yards of road at Wadleigh Falls and 150 feet at Packers Falls. There are two dams: Wadleigh dam is breached and no longer impounds water. The Wiswall dam interrupts the riverine character of the river (width and flow) for less than about 100 yards above the dam. Nevertheless, the "impoundment" is geologically considered to extend to the first rapids (7,000' upstream), covering 30 acres. (Hydro application of John Webster, Southern N.H. Hydro.)

There are twelve active or inactive (reforested) farms and tree farms with between a half-mile and a mile of riverfrontage. There are about 15 miles of undisturbed riverfrontage in the two towns, largely woodlands.

Development is scattered. There are two campgrounds where trailers are close to the water, which represent perhaps a quarter mile each. Four subdivisions are visible, but two have common land as their waterfrontage, and the other two have houses set well back from the river (Toon Lane in Lee, Riverfields below Packers Falls.) Almost all houses are screened from the water. These areas of development are dispersed along the river, so eliminating any one segment is difficult. (see map.)

APPENDIX: RESOURCE ASSESSMENT (An annotated USGS-based map will be presented. A smaller-scale version is attached.)

A. NATURAL RESOURCES

1. Geologic Resources (See map of Geological Resources.)

There are three scenic waterfalls: Wadleigh Falls, Wiswall Falls, and Packers Falls, which is a Class III (spring) and Class II (summer) whitewater rapid. (see AMC Guide description under RECREATION below. Exerpts attached.)

There are significant unmined sand and gravel deposits in Durham, south of Packers Falls. High quality ground and surface water in the corridor is considered a geologic resource by Mary Dowse, Assistant State Geologist. There are also exemplary deposits of Exeter diorite and Kittery quartzite at Wiswall Falls and Wadleigh Falls.

In the river corridor there are 16,500 feet of Prime farmland, as identified by the USDA Soil Conservation Service.

3. Vegetation/Natural Communities

In Lee, there are 960 acres of wetlands associated with the Lamprey. In a rating system devised by Golet and Larson (Classification of Freshwater Wetlands in the Glaciated Northeast, 1974), three-quarters of Lee's most significant wetlands are those associated with the Lamprey River. (No comparable inventory has been done in Durham.)

According to Art Bohrer of UNH, the Turtlehead plant, an important host to the rare Baltimore butterfly, is found on the riverbanks south of Packers Falls in Durham, along with Cardinal flowers, a protected species. *Gentiana Crinita* (Fringed gentian), a Threatened plant has been sited in Lee. Found at Wadleigh Falls by Garrett Crow of UNH were the Rare and Endangered: *Callitriche Anceps*; *Carex Cristatella*; *Glyceria Acutiflora*; and *Habenaria Flava*, var. *Herbiola*. Downstream was the Endangered "*Galium Labradoricum*". (see attached "Rare and Endangered Plants of N.H.: Town of Lee" by Dr. Garrett Crow, UNH, 1979)

The attached inventory by Dave Allan of UNH includes 40 species of trees and 45 species of bushes native to the Lamprey corridor.

4. Fish Resources

On April 17, 1985, the General Court of the State of New Hampshire adopted a resolution stating that the Lamprey River is "recognized as the state's most significant river for all anadromous (fish) species." Shad, alewives and salmon are found up to the Wiswall dam. Native (naturally reproducing) fish species sought by fishermen include small- and large- mouth bass, chain pickerel, two species of sunfish, American eel and brown bullhead. In addition, in a program to restore certain species, the N.H. Fish and Game Department are stocking shad, rainbow, brown and brook trout. Rainbow trout are believed to be also naturally-producing.

5. Water Quality

This segment of the Lamprey is now Class B, suitable for swimming, fishing and other recreational uses.

The Lamprey River Watershed Association has conducted a water quality monitoring program which showed overall high water quality. Sources of possible pollution (Epping Wastewater Treatment Facility, and areas near the older camp areas) were found to have a localized impact on water quality only, diluted to acceptable levels in a short distance downstream.

According to the Water Resources Division, the most recent testing of the Lamprey was on August 11th and 12th, 1988, at one site just below Wadleigh Falls. The fecal coliform counts were one-quarter the State standard for swimming on the first day, and half the second. (Total coliform was high on the second day, but this measure is considered meaningless by the Water Resources). Intensive monitoring is scheduled for next summer. This is essential for pinpointing sources of pollution so that appropriate corrective measures can be devised.

The Lamprey is a major tributary of Great Bay. Non-point source pollution from tributaries is seen as a clear threat to the Bay's shellfishing industry and its function as a nursery for finfish harvested the length of the Eastern seaboard. Consequently, scientists at the Jackson Estuarine Laboratory have petitioned for the Lamprey to be protected both by local zoning and by the national Wild and Scenic program because of its significant impact upon the federally-protected Great Bay.

6. River Corridor

The river is crossed by four secondary roads, one power line (Wiswall Road) and one railroad in 10 miles. Commercial development is limited to two private campgrounds below Lee Hook Road and one above Wadleigh Falls.

In most of the five developed areas, houses have been set back, screened, or buffered by common land along the river so that they are largely unnoticeable. Two of the developments are clusters with their river frontage devoted to common area open space (Riverside, above Wadleigh Falls, and Lamprey Lane below Lee Hook Road off Wednesday Hill Road); a third (Riverfields, off Bennett Road in Durham) has deed restrictions with compulsory 100' setbacks and maintenance of natural vegetation to obscure the view of the houses. The Toon Lane development has a few houses on the water which are set back over 100' from the water. The Jenkins Lane area has seasonal camps converted to year-round, with 100' frontage each, and the nearby Ferndale Acres campground has some trailers close to the water.

Open Space accounts for most of the river. There are 12 large farms in this segment. In Lee, 8 properties account for 7.8 miles of open woods and fields with riverfrontage bordered by woods, and in Durham there are 7 miles of undeveloped riverfrontage, largely wooded. In Durham, one stretch of river has only three structures on either side for 6,000 feet (Lee line to Packers Falls), with the rest woodland. Farther downstream, a stretch of woods (some backed by fields) facing the Doe Farm Town forest extends 7,500 feet. In general, woodland predominates below Lee Hook Road, and above are woods, and fields screened from the river by a zone of trees.

The AMC Guide calls the Lee/Durham stretch of the Lamprey "superb...for a quiet retreat into the woods." The National Parks Service stated that it was of particular value, being such an unspoiled resource so close to the populated Seacoast and Boston areas.

7. Natural Flow Characteristics

There are two dams: the Wadleigh Falls dam at Rte. 152/Tuttle Road in Lee, and Wiswall Falls below Wiswall Road in Durham. The Wadleigh Falls dam is breached, and deemed by WSPCC to be causing no ponding (See IMPOUNDMENT below.)

At Wiswall dam, the riverine quality of the river is interrupted for only a few hundred feet above the Wiswall dam. Farther upstream, flow is not affected and there is no visual broadening of the river. Aquatic habitats are maintained below the dam, even at low summer water.

Water is about 3 feet higher in winter than summer on the Lamprey. The AMC Canoe Guide describes the flow of this segment as "High to medium water (spring)" above Wadleigh Falls, and "High water (late March to early May) and Medium water (average summer rainfall)" from Wadleigh to Newmarket. Rapids below Lee Hook Road, Wiswall and Hook Island can cause "scratchy" canoeing in low summer water.

B MANAGED RESOURCES

1. Impoundments

There are two dams: Wadleigh Falls dam in Lee and Wiswall dam in Durham. The Wadleigh Falls dam is owned by Peter Dodge of Lee. An inspection by the N.Y. Regional Office of FERC conducted January 12, 1983 found that "The Lamprey river is flowing uncontrolled through two breaching points." The River Basin Management Plan for the Lamprey River, by N.H. WSPCC, 1982, stated: "As of June 1982, the dam was in ruins." (pg. 18) and "The Wadleigh Falls dam and Lee Hook dam are no longer impounding water." (pg.37).

The Wiswall dam, owned by the Town of Durham, has been used for flood control in two instances of severe flooding in the past two decades. About 15 feet in height and in sound condition, the dam is built atop natural ledge. According to the hydro license application of John Webster, the impoundment extends to the first set of rapids 7,000 upstream at Hook Island Falls. However, the riverine quality of the river is impacted for no more than 100 yards upstream of the dam.

2. Water Withdrawals and Discharges

a. Withdrawals:

The only permitted withdrawal is for UNH (User Name: UNH, 20066; SDID 20066-S02) for withdrawal at the pumping station at the intersection of Packers Falls Road and Wednesday Hill Road. This is part of Durham's Oyster River public water line, leading to the water treatment plant, "able to pump a reserve 3 mgd from the Lamprey River." ("Southern Strafford Region : An Environmental Planning Study", Strafford Regional Planning Commission, 1975). The Lamprey is identified as an "emergency" water supply in "The Water Supply Study for Southern N.H." prepared for The Water Supply Task Force in 1979. (table 6-2, note 18). Increased demand for water may result from an increased population: the University is considering lifting its cap on the number of students and is now planning new dormitories.

b. Discharges:

The only permitted discharge into the river is from Epping's wastewater treatment plant, upstream of the proposed segment.

3. Hydroelectric Resources

A license for a hydroelectric facility was applied for at Wadleigh Falls in 1982, and a license granted at Wiswall Falls in June of 1989. (under appeal by Towns of Lee, Durham, N.H. Attorney General's Office, and several individuals). There has been no subsequent action on the Wadleigh application. The ultimate use of either dam for hydroelectric generation is unknown. At this time, the Wiswall dam is still owned by the Town of Durham, and Wadleigh dam by Peter Dodge of Lee.

C. CULTURAL RESOURCES

1. Historical or Archeological Resources

The Lamprey has been a historical (and pre-historical) center of activity for over 8,000 years. According to Gary Hume of the Division of Historical Resources, the Wadleigh Falls prehistoric site is of Statewide significance. The report prepared by Professor Charles Bolian (attached) documents archeological artifacts over 8,500 years old.

There are also remains of the extensive series of mills already flourishing on the river in the 1770's. The Wiswall Falls Mill Site was placed on the National Register of Historic Places due to the remains of a very extensive 19th century mill complex. The Registration Form says: "The Wiswall Falls Mill Site possesses integrity of location, design, setting, materials, and association. The site is associated with events that have made a direct contribution to the industrial development of the town. ... For its important role in Durham's 19th-century economy, and for the information potential that further subsurface investigation may yield, the Wiswall Falls Mill Site meets criteria A and D of the National Register of Historic Places." (A= Resources associated with events that have made a significant contribution to the broad patterns of our history. D= resources that have yielded, or are likely to yield, information important in pre-history or history.)

2. Community Resources

The Lamprey is heavily used for recreation. Landowners and residents of towns throughout the region come to swim, fish, ski, and canoe on the river. Birdwatching is also common. (see RECREATION and PUBLIC ACCESS sections for details.)

In 1984, the Strafford Regional Planning Commission prepared a River Management Plan for the Lamprey. This effort included preparing annotated maps of the river with potential recreation areas, public access points, scenic areas, potential sources of pollution and historic landmarks. An inventory of both State and local land use regulations applying to the river was also included. (Exerpts from the Plan accompany nomination form.)

Sections of the Durham masterplan identifying the river as an important resource are cited under LAND USE (p.14) below.

D. RECREATIONAL RESOURCES

1. Fishing, Boating, Swimming and Other Recreation

a. Recreational Areas:

1) The Town of Durham owns:

- . Doe Farm, with 800 acres, 750' of frontage. Provides extensive trails for hiking, jogging and skiing;
- . Packers Falls Recreation Area, providing swimming, tubing, whitewater area (Parking provided);
- . Wiswall Road heavily used for swimming, fishing, canoeing, and picnicking.

On land adjoining the Wiswall site, Carl Spang allows hiking, fishing, picnicking, hunting and snowmobiling through agreements with Salmon Unlimited and the Great Bay Sno-rollers.

- 2) The Durham Boat Company (Jim Dreher) provides instruction, storage and launching facilities for sculling shells below Moat Island in Durham.
- 3) Campgrounds: The Lamprey River Campground (above Wadleigh Falls) Wellington Campground (Richard Wellington) and Ferndale Acres Campground (Walter George) provide for seasonal camping.

b. Recreational Activities

Fishing: A 1985 survey conducted by the N.H. Department of Fish and Game found that anglers from throughout New England spent 875 fishing-hours on a 3/4 mile stretch of river from Wiswall Falls to Packers Falls in a single month. Fishing continues into the winter, with ice-fishing popular the length of the river. Public access for fishing is largely informal, with Salmon Unlimited negotiating agreements with private property owners in key areas.

Canoeing: Commonly-used informal canoe launching areas provide access to 36 miles of river, starting in Deerfield and ending at the dam in Newmarket. The AMC River Guide (attached- see pg. 216 and 217) describe the Lamprey in Lee thusly: "a long, smooth stretch twists through old pastures and woods for another 5 miles past the mouth of the North River to Wadley falls." Below Wadleigh falls: "For a quiet retreat into the woods, the first 4 miles are superb... 4 miles of quiet paddling past densely forested banks of hemlocks and hardwoods to the Lee Hood Road bridge."

For more adventurous canoists and kayakers, the AMC Guide recommends Durham's Packers Falls recreation area, which provides "one of the most challenging rapids on the Piscataqua Watershed. It is a roaring Class III run in early spring, and it is often run well into the summer as a Class II drop. There are well-developed portage trails for those who want to run Packers Falls several times."

Winter brings skaters, skiers and ice fishermen. Local skimobile clubs have negotiated with private landowners in building a trail which crosses and re-crosses the river for miles. This trail is also enjoyed by cross-country skiers.

Horseback Riding: Trails along the river at the Benevento Sand & Gravel and Spang properties are also used for horseback riding (over 30 horses are boarded in the Packers Falls/ Wiswall area, excluding University barns at Highland House).

c. Existing recreational potential:

There is potential for more public swimming and boat launching areas, especially at Durham-owned Doe Farm. The Town of Durham is finalizing plans for tripling the parking provided at Packers Falls, and providing a canoe launching area nearby.

2. Access

See RECREATION AREAS above. In addition, all the bridges are used for boat launching, fishing and swimming. Common areas for clusters provide access to Riverfields in Durham, Lamprey Lane in Lee, and Riverside in Lee.

E. OTHER RESOURCES

1. Scenic Characteristics

The best views OF the river are from the bridges: Wadleigh Falls Road, Lee Hook Road, Wiswall Road, and especially the rapids at Packers Falls.

FROM the river, almost the whole river is scenic, but especially the farms below Wadleigh Falls and the three waterfall areas.

2. Land Use

(See appended ordinances)

Zoning: Durham Wetlands Ordinance allows no septic systems or other structures within 75 feet of surface waters (or very poorly drained soils), and no non-septic structures within 50' of any poorly drained soil.

Durham Shoreland Ordinance: major revisions are under consideration by the Town Council at this time. The proposed setback is 100-150 feet from the High Water line, with no clearcutting of vegetation.

Durham's Aquifer Ordinance: A new ordinance is under consideration which is similar to Lee's.

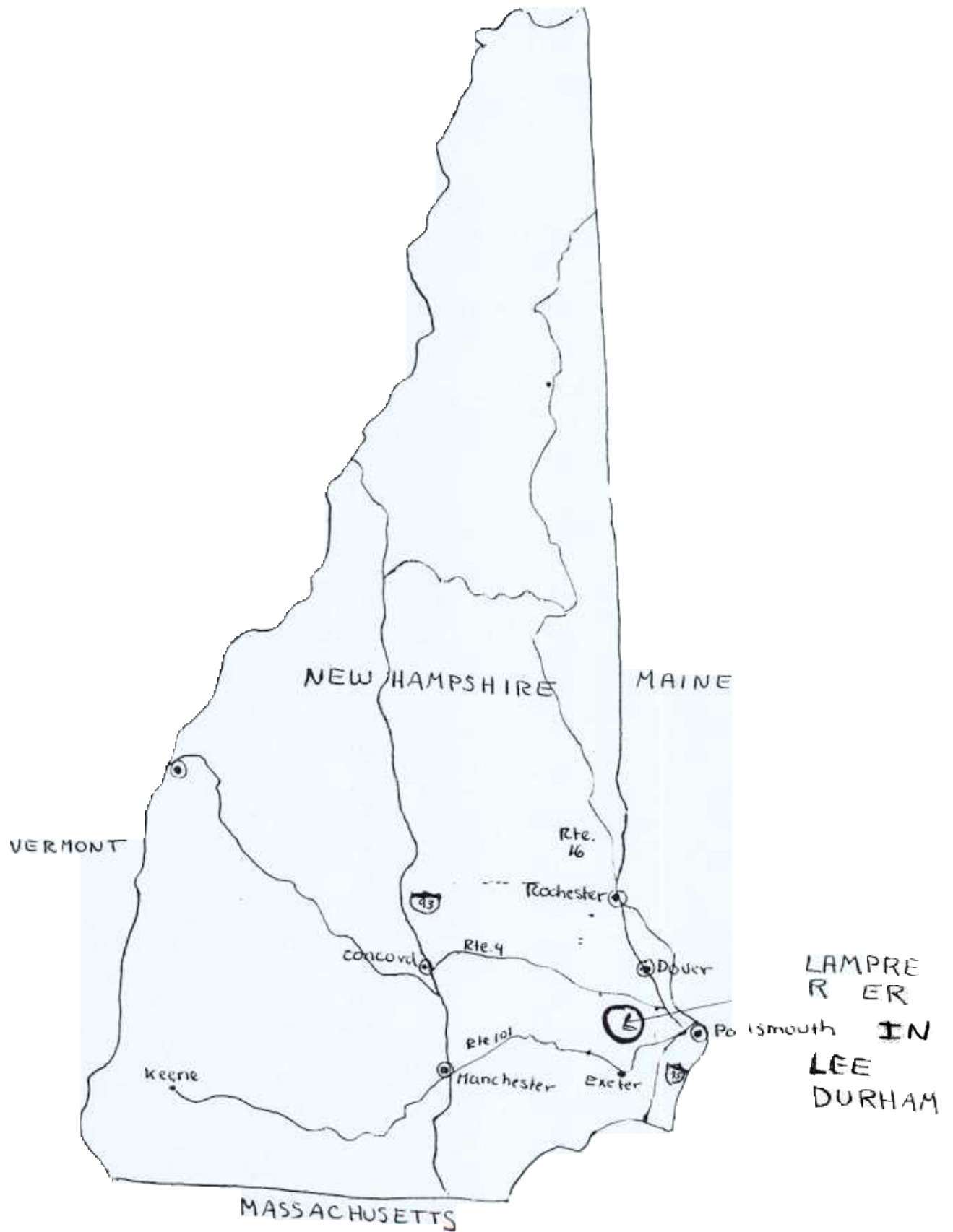
Lee's Wetland Ordinance: Prohibits septic systems within 125 feet of any wetland, and structures within 75 feet.

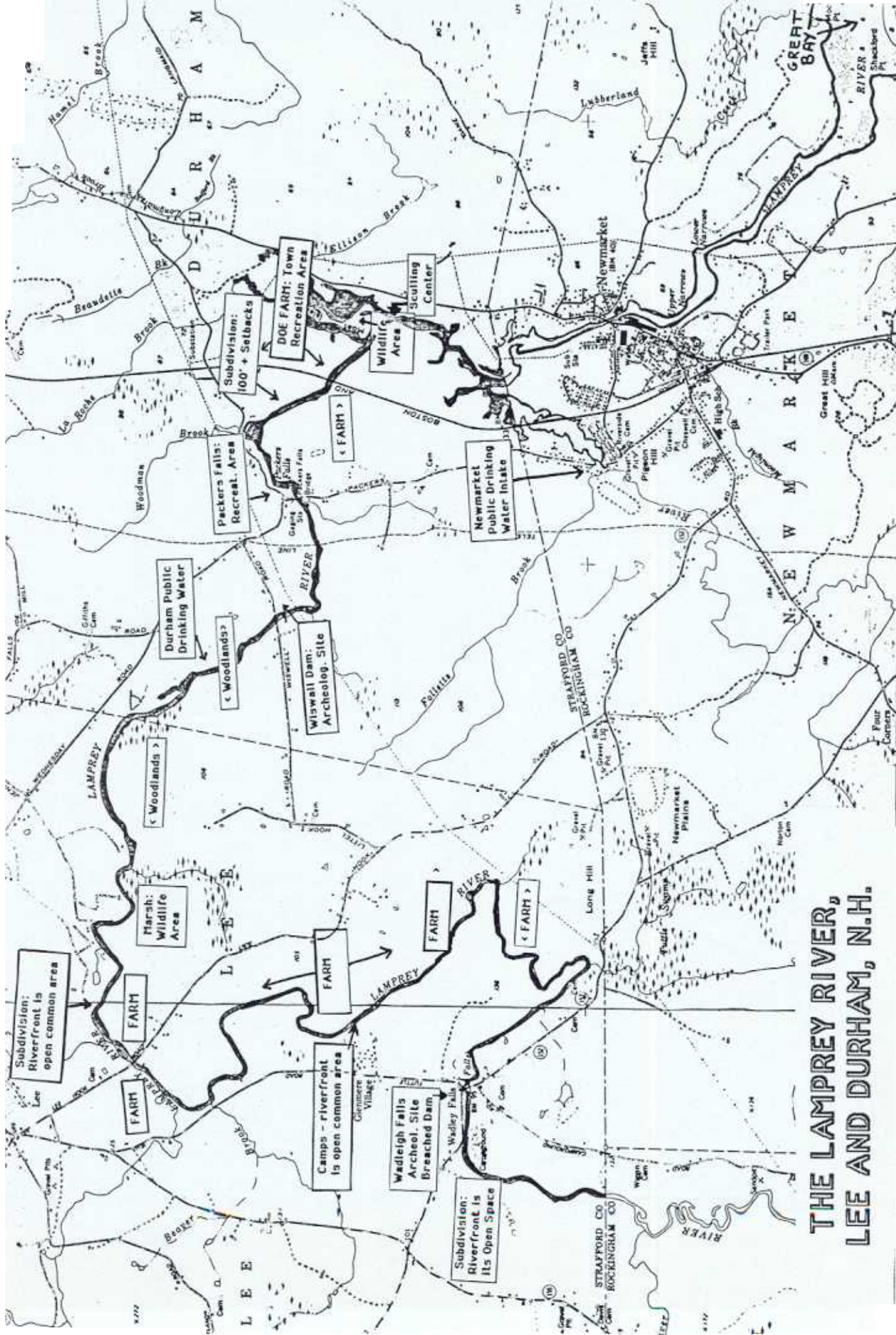
Lee's Shoreland Ordinance: Prohibits construction within 100 feet of the shore, and prohibits removal of more than 50% of shoreland vegetation.

Lee's Aquifer Ordinance: Allows low density residential only, with less than 10% of land area covered by impervious surfaces.

Both towns have cluster ordinances which have encouraged the provision of open space common area along the riverfront.

LOCUS MAP





THE LAMPREY RIVER,
LEE AND DURHAM, N.H.

*The excerpts below describe the Important Farmlands shown on the
Geologic Resources Map.*

from: UNITED STATES DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

July 7, 1977

IMPORTANT FARMLANDS OF STRAFFORD COUNTY, N.H.

The Department of Agriculture and the Soil Conservation Service are concerned about any action that tends to impair the productive capacity of American agriculture. The Nation needs to know the extent and location of the best land for producing food, feed, fiber, forage, and oilseed crops, the land that has special qualities for growing specific high-value crops, and other important lands for producing crops.

It is SCS policy to make and keep current an inventory of prime farmland and unique farmland of the Nation. This inventory is being carried out in cooperation with other interested agencies at the national, state, and local levels of government. The objectives of the inventory is to identify the extent and location of the important rural lands. This map displays the categories recognized in the national inventory.

Prime Farmland

Prime farmland is land best suited for producing food, feed, forage, fiber, and oilseed crops, and also available for these uses (the land could be cropland, pastureland, forest land, or other land, but not urban builtup land or water). It has the soil quality, growing season and moisture supply needed to produce sustained high yields of crops economically when treated and managed, including water management, according to modern farming methods.

Unique Farmland

Unique farmland is land other than prime farmland that is used for the production of specific high-value food and fiber crops. It has the special combination of soil quality, location, growing season, and moisture supply needed to produce sustained high quality and/or high yields of a specific crop when treated and managed according to modern farming methods. Criteria for defining and delineating this land were determined by State and local agencies in New Hampshire.

Additional Farmland of Local Importance

In some local areas there is concern for certain additional farmlands for the production of important crops, even though these lands are not identified as having national or Statewide importance. These lands have been identified by local agencies.

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- A. AMC RIVER GUIDE: Excerpts
- B. THE BIRDS OF THE LAMPREY RIVER CORRIDOR
- C. INVENTORY OF FLORA AND FAUNA, LAMPREY CORRIDOR
- D. RARE AND ENDANGERED PLANTS OF (LEE) N.H.
- E. N.H. NATURAL HERITAGE INVENTORY LIST AND MAP, LEE
- F. AD HOC COMMITTEE REPORT: A REGIONAL PERSPECTIVE ON CONSERVATION LANDS
- G. A SUMMARY HISTORY OF THE LAMPREY RIVER
- H. CULTURAL RESOURCES REVIEW, WISWALL FALLS
NATIONAL REGISTER OF HISTORIC PLACES REGISTRATION
FORM for WISWALL FALLS MILL SITE
- J. THE WADLEIGH FALLS SITE: An Early Holocene Site
- K. THE LAMPREY RIVER MANAGEMENT PLAN, excerpts (by SRPC)
- K. TOWN OF DURHAM MASTERPLAN UPDATE, 1989
- M. ZONING ORDINANCE, LEE, N.H. 1989
- N. RIVER MONITORING SITES; NEWSLETTER; CANOEING THE LAMPREY
By The Lamprey River Watershed Assoc.
- O. TRANSCRIPT Article: ON PROTECTING OUR OPEN LAND
- P. TOWN OF LEE AND TOWN OF DURHAM LETTERS OF SUPPORT
FOR WILD AND SCENIC DESIGNATION
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MAPS

- THE LAMPREY RIVER, LEE AND DURHAM (Resource Inventory)
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(Accompanied by : "Important Farmlands of Strafford County"
explaining terminology)
- 3 LAMPREY RIVER LAND USES

AMC

RIVER GUIDE



NEW HAMPSHIRE
VERMONT

NH 102/107 bridge — West Epping 3½ mi/5½ km

Description: Flatwater, quickwater, Class I
 Navigable: Medium water
 Scenery: Forested, cottages
 Map: USGS Mt. Pawtuckaway 15
 Portage: (3½ mi L dam)

Put in either at the bridge, or into Dead Pond if the 50 yards of Class II rapids are too low. The pond is a pleasant paddle for a mile past some cottages. Then the river narrows again, drops over some easy rapids past a small bridge and the NH 101 bridge, and continues for a couple of miles to the backwater of the dam, which is below the next bridge.

West Epping — Wadley Falls 12 mi/19¼ km

Description: **Quickwater**, Class II
 Navigable: High to medium water (spring)
 Scenery: Forested, town
 Map: USGS Mount Pawtuckaway 15
 Portage: (12 mi R dam at Wadley Falls)

Below the dam in West Epping is a short pool. Class II ledges begin under the next bridge and continue for ½ mile, gradually becoming easier. The river passes a few rock dams, and the final ledge is underneath the first bridge in Epping (3½ miles).

Below Epping (4 miles) the river meanders for 3 miles to the NH 87 bridge. After the bridge a long, smooth stretch twists through old pastures and woods for another 5 miles past the mouth of the North River (10¼ miles) to the Wadley Falls dam (12 miles).

Wadley Falls — Newmarket 10½ mi/17 km

Description: Flatwater, quickwater, Class I–III
 Navigable: High water (late March to early May)
 Medium water (average summer rainfall)
 Scenery: Forested
 Maps: USGS Mount Pawtuckaway 15, Dover 15
 Portage: 7¼ mi L Wiswall Falls Dam 50 yd

For a quiet retreat into the woods, the first 4 miles are superb. Canoeists continuing below the bridge on Lee Hook Road may have a scratchy time in moderately high water because the rapid starting under the bridge, and another shorter one a mile further, need rather high water to run well.

One feature of the lower stretch is Packers Falls, which are not actually falls but rather one of the most challenging rapids in the Piscataqua Watershed. It is a roaring Class III run in early spring, and it is often run well into the summer as a Class II drop. There are well-developed portage trails for those who want to run Packers Falls several times.

Below the dam at Wadley Falls, there is a brief rapid; then 4 miles of quiet paddling past densely forested banks of hemlocks and hardwoods to the Lee Hook Road bridge. Below the bridge are 200 yards of easy Class II rapids with large combers in high water. At the end of the rapid, there is a broken dam that cuts diagonally across the river; it can easily be run by following the current rather than the shore. A combination camp and trailer park extends for the next mile along the left bank to a short rapid on either side of an island (5 miles).

It is another 2¼ miles to the Wiswall Road bridge and Wiswall Falls Dam (7¼ miles). Below the dam there is a 200-yard Class II rapid which, if unrunnable, can be carried on the left. Another ¾ mile brings you to Packers Falls (8 miles).

Caution! Take out on the left at least 20 yards above the bridge and scout Packers Falls. This run is a difficult Class III in high water, and a moderate Class II, with some scratching at the bottom, in medium water. There are two more short Class II rapids just below Packers Falls, then 2½ miles of flatwater to Newmarket, where the route through the flowage may be obscure. The Piscassic River (9¼ miles) enters on the right. Take out at Newmarket on the left just above the dam (10½ miles).

LITTLE RIVER**ME**

The canoe season is short but exciting on the Little River. Canoe it early in the morning or on an overcast day, because it heads into the afternoon sun for most of its length.

There is good current for about 1½ miles below the NH 126 bridge in Barrington. Then there are three short, easy Class II pitches as the river parallels US 202. Stay to the left of the island. Just above the US 202 bridge there is a quiet pool behind an old dam. **Caution!** The sluiceway is runnable, but it must be scouted, for there are some sharp boulders to avoid. When the water is really high, there are powerful currents that make it difficult to control a boat in the narrow channel.

The river below the US 202 bridge (2 miles) is mostly quickwater, with a few Class II rapids, for 2½ miles to a small iron bridge beside a house on the right. In this section there are two pairs of bridge abutments that predate the Revolution. Past the bridge the river is sluggish for ½ mile, below which there is another ½ mile of Class I and II whitewater. Halfway down the rapids at a sharp right turn there is a Class II+ ledge passable on the left, that stretches almost all the way across the river. The rapids end 50 yards below the Berrys Hill bridge (5½ miles). The remaining 2 miles to NH 125 contain flatwater.

Below the NH 125 bridge (7½ miles) there is ½ mile of slack current to a 25-foot waterfall. **Caution!** At a stone abutment on the right 20 yards above the first sign of rapids, take out on the right and carry 125 yards along an old road. This is a good picnic and rest spot — the falls shoot out between massive rocks, and they make an impressive sight. The next ¼ mile is Class II–III: difficult in very high water, scratchy in moderately high water, and impassable in anything else. The rapids end with an S turn between high banks, followed by a rock garden that is likely to add a few scratches to your boat. The next 1½ miles to the Rochester Neck Road bridge are a pleasant quickwater run over a sandy bottom; catfish are often visible here.

One-half mile below the Rochester Neck Road bridge (10 miles), the Isinglass empties into the Cocheco River. It is 1¼ miles down the Cocheco to the next crossing, a bridge on County Farm Road (11¾ miles). This section is all flatwater except for the last 100 yards, where there is an easy Class II rapid.

LAMPREY RIVER

NH

The Lamprey is one of the longest rivers in the Piscataqua Watershed, and it is probably the flattest. The section above Raymond offers Class I rapids for spring canoeists. Below town

the river can be run for most of the year because there are few rapids. Packers Falls, Class II or III depending on the water level, is runnable well into the summer by kayak and canoes.

Deerfield — Raymond

9 mi/14½ km

Description: Flatwater, quickwater, Class I–II
 Navigable: High water (late March to early May)
 Scenery: Forested, settled
 Map: USGS Mount Pawtuckaway 15

Three-quarters of a mile above Raymond, a tributary named Cider Ferry enters on the right, flowing from Onway Lake. The name came from a barrel of cider that slipped and burst as it was being taken over the stream by early settlers, before there was a bridge. "But," as someone remarked, "as fish do not drink cider, no harm was done."

Put in 2 miles south of Deerfield Center at the junction of NH 43 and 107. The Lamprey is at this point a narrow trout stream, with Class I–II rapids, shallow riffles, and quickwater. Beavers have made a strong resurgence on this part of the river, and you will surely encounter several of their dams. One and a half miles below, before the first bridge, are two ledges. The first is runnable on the left in very high water; the second must be lined or carried. From the first bridge to NH 101 is 2½ miles, largely quickwater with a few Class I rapids, including a 100-yard stretch that ends right of NH 101.

From the NH 101 bridge (4 miles) the next 1½ miles are flat and wide: follow a straight course here. Then there are more Class I rapids in the next mile to the Langsford Road bridge (6½ miles) with a Class II–III ledge just below. The rapids end in another ¼ mile, and the final 2¼ miles to Raymond (8 miles) and the side-road bridge east of town are once again flat and wide. Take out at this bridge, since there is a gorge in the next mile.

Raymond — NH 102/107 bridge

1 mi/1¾ km

Most of this distance is flatwater or quickwater. The gorge is within sight upstream from the bridge. It can be lined in low water, but it is difficult to portage.

THE BIRDS OF THE LAMPREY RIVER CORRIDOR

as identified by Maggie Wittner.

(This inventory was collected over two years from the Lamprey River area south of Packers Falls.)

* = species present during nesting season and suspected of nesting

E = Endangered species under N.H. Code of Admin. Rules

T = Threatened species.

Under the Nature Conservancy/N.H. Natural Heritage Inventory

ranking system: S1 = Critically imperiled/endangered in state

S2 = Imperiled/endangered in state

S3 = Rare/threatened in state.

(Birds are listed in taxonomic order.)

Double-Crested Cormorant (S1)	Ruffed Grouse*
Great Cormorant	Wild Turkey
Great Blue Heron	Rock Dove*
Green-Backed Heron*	Mourning Dove*
Mute Swan*	Yellow-Billed Cuckoo
Canada Goose	Black-Billed Cuckoo*
<u>Ducks:</u>	Great Horned Owl*
Mallard*	Barred Owl*
Wood*	Eastern Screech Owl* (S3)
Black*	Whip-Poor-Will* (T)
Ring-Necked (S2)	Common Nighthawk (S2)
Northern Pintail	Chimney Swift*
Common Goldeneye	Ruby-Throated Hummingbird*
Hooded Merganser (S3)	Belted Kingfisher*
Common Merganser*	Yellow-Shafted Flicker*
Solitary Sandpiper	Yellow-Bellied Sapsucker
Spotted Sandpiper*	Downy Woodpecker*
Common Snipe*	Hairy Woodpecker*
Herring Gull (S3)	Pileated Woodpecker
Great Black-Backed Gull	Eastern Kingbird*
Turkey Vulture (S3)	Great-Crested Flycatcher*
Bald Eagle (SH), (E)	Phoebe*
Northern Harrier* (S2), (T)	Eastern Wood Pewee*
Northern Goshawk	Least Flycatcher
Sharpshinned Hawk*	Horned Lark (S3)
Red-Shouldered Hawk*	Water Pipet
Broad-Winged Hawk*	<u>Swallows:</u>
Red-Tailed Hawk*	Tree*
Osprey* (S2), (T)	Rough-Winged*
American Kestrel*	Barn*
Merlin	Blue Jay*
Peregrine Falcon (S1), (E)	American Crow*

SUMMARY NEXT PAGE

Common Raven
 Tufted Titmouse*
 Black-Capped Chickadee*
 Brown Creeper*
 White-Breasted Nuthatch*
 House Wren*
 Ruby-Crowned Kinglet
 Golden-Crowned Kinglet*
 Eastern Bluebird*
 Wood Thrush*
 Blue-Gray Gnatcatcher
 Veery
 Hermit Thrush
 Swainson's Thrush
 American Robin*
 Gray Catbird*
 Northern Mockingbird
 Brown Thrasher
 Cedar Waxwing*
 Eastern Starling*
 Yellow-throated Vireo*
 Solitary Vireo
 Warbling Vireo*
 Red-Eyed Vireo*
 Philadelphia Vireo

Warblers:

Prothonotary
 Blue-Winged* (S3)
 Golden-Winged (S2)
 Tennessee (S2)
 Nashville
 Northern Parula
 Black and White*
 Black-Throated Blue
 Blackburnian
 Chestnut-Sided*
 Magnolia
 Cape May
 Yellow-Rumped
 Black-Throated Green
 Prairie
 Bay-Breasted
 Blackpoll
 Pine*
 Palm (S1)

(Warblers)

Yellow*
 Canada*
 Wilson's* (S1)
 Northern Waterthrush
 Ovenbird
 Common Yellowthroat*
 American Redstart*
 Rose-Breasted Grosbeak*
 Evening Grosbeak
 Northern Cardinal*
 Indigo Bunting*
 Rufous-sided Towhee

Sparrows:

Vesper (S3)
 Savannah*
 Song*
 Tree
 Field
 Chipping*
 Dark-Eyed Junco
 White-Crowned
 White-Throated
 Fox
 Swamp*
 Eastern Meadowlark
 Bobolink
 Red-Winged Blackbird*
 Rusty Blackbird
 Brown-Headed Cowbird*
 Common Grackle*
 Northern Oriole*
 Orchard Oriole* (S2)
 Scarlet Tanager*
 House Sparrow*
 House Finch*
 American Goldfinch*
Purple Finch

Suspected of Nesting in Area: <u>73</u> Critically Imperiled (S1): <u>5</u> Imperiled/Endangered (S2): <u>7</u> Rare/Threatened (S3,T): <u>8</u> TOTAL SPECIES: <u>139</u>
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INVENTORY OF FLORA & FAUNA, LAMPREY CORRIDOR
(BELOW HOOK ISLAND, ABOVE WISWALL)
By Dave Allan, State Biologist, Soil Conservation Service

MAMMALS

1. Masked Shrew
2. Smoky Shrew
3. Thompson's Pigmy Shrew
4. Short-tailed Shrew
5. Hairy-tailed Mole
6. Star-nosed Mole
7. Little Brown Bat
8. Silver-haired Bat (?)
9. Eastern Pipistrelle (?)
10. Big Brown Bat
11. New England Cottontail
12. Snowshoe Hare
13. Eastern Chipmunk
14. Woodchuck
15. Gray Squirrel
16. Red Squirrel
17. Southern Flying Squirrel
18. Beaver
19. Deer Mouse
20. White-footed Mouse
21. Meadow Vole
22. Pine Vole
23. Muskrat
24. Norway Rat
25. House Mouse
26. Meadow Jumping Mouse
27. Porcupine
28. Coyote
29. Red Fox
30. Raccoon
31. Ermine
32. Long-tailed Weasel
33. Skunk
34. White-tailed Deer
35. Moose (track in wet field)

SUMMARY:

S2 (Imperiled/endangered: **1 Mammal, 1 Amphibian, 1 Bird**)
S3 (Rare/threatened: **3 Reptiles, 4 Birds**)

Under the Nature Conservancy/N.H. Natural Heritage Inventory ranking system: SH = Of historical occurrence in the state, with the expectation it may be rediscovered
S1 = Critically imperiled/endangered in state
S2 = Imperiled/endangered in state
S3 = Rare/threatened in state.

REPTILES

1. Smooth Green Snake
2. Common Garter Snake
- (S3) 3. Eastern Hog-nosed Snake
4. Common Water Snake
5. Ribbon Snake
6. Eastern Ringneck
7. Racer (Black Snake)
8. Milk Snake
- (S3) 9. Spotted Turtle (?) O.K. 88
- (S3) 10. Blanding's Turtle * Special N.H. rare species) 7/9/88 pond
11. Snapping Turtle
12. Wood Turtle (Tortoise)
13. Painted Turtle

AMPHIBIANS

- (S2) 1. Jefferson Salamander (NH rare species)
2. Spotted Salamander
3. Newt
4. Red-backed Salamander
5. Spring Peeper
6. Gray Treefrog
7. Bull Frog At one time there was a blue one on the pond.
8. Green Frog
9. Wood Frog
10. Leopard Frog
11. Common American Toad

BIRDS

1. Mallard
2. Black Duck
3. Blue-wing Teal
4. Wood Duck
- (53) 5. Turkey, Vulture
6. Sharp-shinned Hawk
7. Marsh Hawk
8. Red-tailed Hawk
9. Red-shouldered Hawk
10. Sparrow Hawk
11. Turkey
12. Ruffed Grouse
13. Ring-necked Pheasant
14. Great Blue Heron
15. Green Heron
- (53) 16. American Bittern
17. Yellow Rail *Rare
18. Killdeer
19. Spotted Sandpiper
20. Woodcock
21. Common Snipe
- (53) 22. Henning Gull
23. Rock Dove - Pigeon
24. Mourning Dove
25. Great Horned Owl
26. Barned Owl
27. Whip-poor-will
28. Nighthawk
29. Chimney Swift
30. Ruby-throated Hummingbird
31. Belted Kingfisher
32. Yellow-shafted Flicker
33. Pileated Woodpecker
34. Yellow-bellied Sapsucker
35. Hairy Woodpecker
36. Downy Woodpecker
37. Eastern Kingbird
38. Eastern Phoebe
39. Least Flycatcher
40. Eastern Wood Pewee
41. Olive-sided Flycatcher
42. Horned Lark
43. Tree Swallow
44. Rough-winged Swallow
45. Bluejay
- (53) 46. Gray Jay
47. Common Crow
48. Black-capped Chickadee
49. Tufted Titmouse
50. White-breasted Nuthatch
51. Red-breasted Nuthatch
52. Brown Creeper

53. House Wren
54. Mockingbird
55. Catbird
56. Brown Thrasher
57. Robin
58. Wood Thrush
59. Veery
60. Eastern Bluebird
61. Rose-breasted Grosbeak
62. Evening Grosbeak
63. Ruby-crowned Kinglet
64. Cedar Waxwing
65. Starling
66. Red-eyed Vireo
67. Black and White Warbler
68. Nashville Warbler
69. Yellow Warbler
70. Myrtle Warbler
71. Chestnut-sided Warbler
72. Ovenbird
73. Yellowthroat
74. American Redstart
75. House Sparrow
76. Bobolink
77. Eastern Meadowlark
78. Red-winged Blackbird
79. Common Grackle
80. Brown-headed Cowbird
- (52) 81. Orchard Oriole
82. Baltimore Oriole
83. Scarlet Tanager
84. Cardinal
85. Indigo Bunting
86. Purple Finch
87. Pine Grosbeak
88. Common Redpoll
89. American Goldfinch
90. Rufous-sided Towhee
91. Slate-colored Junco
92. Tree Sparrow
93. Chipping Sparrow
94. Field Sparrow
95. White-crowned Sparrow
96. White-throated Sparrow
97. Fox Sparrow
98. Song Sparrow
99. Snow Bunting

BUTTERFLIES

1. Monarch
2. Great Spangled Fritillary
3. Harris Checker-spot
4. Eastern Meadow Fritillary
5. Mourning Cloak
6. American Painted Lady
7. Hunter's Butterfly
8. Viceroys
9. White Admiral
10. Red-spotted Purple Admiral
11. Common Wood Nymph
12. Silver-spotted Skipper
13. Clouded Sulpher
14. Cabbage Butterfly
15. Tiger Swallow-tail, Eastern
16. Black Swallow-tail
17. Spicebush Swallow-tail
18. Common Blue
19. The Harvester

MOTHS

1. Five-spotted Hawkmoth (Tomato Hornworm)
2. Hummingbird Moth
3. Cecropia (lives on Blueberry bushes under net)
4. Polyphemus
5. Luna
6. Roary Maple Moth
7. Iabella Moth (Woolly Bear)
8. Fall Webworm
9. Vingo Tiger Moth
10. Eight-spotted Forester (grape)
11. Spotted Cutworm
12. Corn Earworm
13. Stalk Borer (corn)
14. Gypsy Moth
15. Pine Tussock Moth
16. Eastern Tent Caterpillar
17. European Corn Borer.

Ref: *Butterflies & Moths..A Golden Guide.. Mitchel & Zim*

TREES

1. Eastern White Pine
2. Pitch Pine
3. Scotch Pine
4. Tamarack - Larch
5. Black Spruce 9bonsai0
6. White Spruce
7. Colorado Blue Spruce
8. Red Spruce
9. Hemlock (weeping & dwarf)
10. Fir Balsam
11. Northern White Cedar
12. Coast White Cedar (naturalizing)
13. Juniper
14. Red Cedar
15. American Yew
16. Butternut
17. Shagbark Hickory
18. Trembling Aspen
19. Hybrid Poplar
20. Weeping Willow
21. Black Birch
22. Yellow Birch
23. Gray Birch
24. Paper White Birch
25. Speckled Alder
26. Beech
27. White Oak
28. Eastern Red Oak
29. American Elm also Japanese Elm (bonsai)
30. Sycamore
31. Black Cherry
32. Choke Cherry
33. Mountain Ash
34. Shadbush
35. Black Locust
36. Staghorn Sumac
37. Smooth Sumac
38. Sugar Maple
39. Red Maple
40. Striped Maple
41. Jack Pine (bonsai)
42. Common Buckthorn
43. Basswood
44. Flowering Dogwood

EXOTICS

1. Tulip Poplar
2. Sweet Gum
3. Redbud
4. Bristly Locust
5. Bald Cypress
6. Redwood (bonsai)
7. Japanese Maples
8. Sycamore Maple (bonsai)
9. Fig
10. Crabapple 'Midwest'
11. Peach
12. Apples
13. Pear
14. Plum
15. Grapes

* Ref: Trees & Shrubs of Northern New England

SHRUBS

1. Sweet Gale
2. Bayberry
3. Sweet Fern
4. Pussy Willow
5. Basket willow
6. Spicebush
7. Skunk Currant
8. Chokeberry
9. Meadow Sweet White)
10. Wild Red Raspberry
11. Black Cap Raspberry
12. Purple Flowering Raspberry
13. High Blackberry
14. Dewberry
15. Swamp Rose
16. Poison Ivy
17. Black Alder - Winterberry
18. Multiflora Rose
19. Moss Rose
20. Climbing Bittersweet
21. Woodbine - Virginia Creeper
22. Leatherwood (*Dinca palusttid*)
23. Alternate-leaved Dogwood
24. Silky Cornel
25. Red Osier Dogwood
26. Labrador Tea (bonsai)
27. June Pink - Purple Azalea
28. Rhodora (naturalizing)
29. Great Laurel (raised from seed)
30. Mountain Laurel
31. Sheep Laurel
32. Bog Rosemary
33. Maleberry
34. Leatherleaf
35. Trailing Arbutus
36. Checkerberry
37. Low Blueberry
38. Highbush Blueberry
39. American Cranberry
40. Mountain Cranberry (bonsai)
41. American Elder
42. Sweet Viburnum
43. Hobble-bush (now dead)
44. Highbush Cranberry
45. Maple-leaved Viburnum
46. Arrow Wood
47. Withenod
48. Steeplebush
49. Hazelnut

EXOTICS

1. Tatarian Honeysuckle
1. Honeysuckle 'Rem-Red'
3. Euonymus Wahoo
4. Euonymus 'Pink Lady'
5. Rosa Rigosa
6. Multiflora Rose
7. Autumn Olive
8. Buckthorn 'Tallhedge'

Ref: Trees & Shrubs of Northern
New England

WILD FLOWERS

WHITE

1. May Apple
2. Bunchberry
3. Yucca
4. Wild Calla -Water Anum
5. White Trillium
6. Painted Trillium
7. Field Bindweed
8. White Fringed Orchis
9. Nodding Ladies-tresses
10. Downy Rattlesnake Plantain
11. Checkered Rattlesnake Plantain
12. Round-leaved Sundew
13. Indian Pipe
14. Round-lobed Hepatica
15. Starflower
16. Bloodroot (also Double)
17. Northern White Violet
18. Pipsissewa
19. Shinleaf
20. Common Strawberry
21. Wood Anemone
22. Goldthread
23. Common Mallow
24. Spring Beauty
25. Bladder Campion
26. Evening Lychnis
27. Bouncing Bet
28. Moss Phlox
29. Common Chickweed
30. Anemone
31. Wintergreen
32. Partridge berry
33. Bluet
34. Yarrow
35. Boneset
36. Queen Anne's Lace
37. Black Snakeroot
38. Dwarf Ginseng
39. White Baneberry
40. Pokeweed
41. Common Plantain
42. Star-of-Bethlehem
43. False Solomon's Seal
44. Canada Mayflower
45. Wild Leek (~~Dane~~)
46. Foamflower
47. Miterwort
48. Squinnet Corn
49. Dutchman's Breeches
50. Common Nightshade
51. Tall Meadow Rue
52. White Clover

53. Dame's Rocket
54. Pussytoes
55. Feverfew
56. Ox-eye Daisy

YELLOW

1. Prickly Pear
2. Yellow Iris
3. Trout Lily
4. Yellow Loosestrife
5. Common St. Johnswort
6. Common Mullein
7. Dandelion
8. Black-eyed Susan
9. Lance-leaved Coneopsis
10. Common Sunflower (Kansas)
11. Japanese Honeysuckle
12. Marsh Marigold
13. Common Buttercup
14. Common Cinquefoil
15. Comfrey
16. Downy Yellow Violet
17. Smooth Yellow Violet
18. Evening Primrose
19. Tansy
20. Hawkweed
21. Jerusalem Artichoke
22. Goldenrod (species)

ORANGE

1. Daylily
2. Tiger Lily
3. Spotted Touch-me-not
4. Butterfly Weed

PINK & RED

1. Red Trillium
2. Moccasin Flower
(also white)
3. Rose Pogonia (cover an acre)
4. Fringed Polygala
5. Columbine
6. Trumpet Honeysuckle
7. Bee Balm
8. Cardinal Flower
9. Wild Geranium
10. Purple-flowering Raspberry (shrub)
11. Purple Fringed Orchid
12. Pitcher Plant (naturalizing)
13. Caroline Spring Beauty (see white)
14. Wild Ginger
15. Red Clover
16. Rose Twisted Stalk
17. Toothwort
18. Wild Bleeding Heart
19. Common Milkweed
20. Joe-Pye Weed
21. Knapweed
22. New England Aster

BLUE_VIOLET

1. Blue Flag
2. Virginia Dayflower
3. Common Blue Violet
4. Fringed Gentian (naturalized .. some albino)
5. Mertensia
6. Periwinkle
7. Blue Phlox
8. Blue-eyed Grass
9. Forget-me-not
10. Gill-over-the-ground
11. Bugle
12. Vetch

GREEN -BROWN

1. Jack-in-the-Pulpit
2. Skunk Cabbage
3. Solomon's Seal
4. Ragweed
5. Lamb's Quarters
6. Common Cattail

Ref: Field Guide to
Wildflowers
Peterson & McKenny

Dear Mr. Weyick;

Thank you for consulting the New Hampshire Natural Heritage Inventory regarding the presence of rare plants, animals and exemplary natural communities located in the town of Lee.

Enclosed is a map of the town with dots indicating the presence of rare species and/or exemplary natural communities. Also enclosed is a list of the "elements" (rare plants, animals and natural communities) known from within the boundaries of the town. Due to the sensitive nature of the elements, their name is not directly matched up with the dots. Also, it is possible for one dot to represent the location for more than one element.

The list consists of four columns: The scientific name, the common name, the state rank and the global rank. Enclosed is an explanation of the ranking system used by the Heritage Inventory.

We feel that the level of information provided is sufficient for the purpose of land use planning and in setting conservation priorities within a town. If more information is necessary, please contact us.

In most cases, information on environmental elements is not the result of comprehensive field surveys. For this reason, the New Hampshire Natural Heritage Inventory cannot provide a definitive statement on the presence, absence, or status of species or natural communities in any part of New Hampshire.

Sincerely,

Edie E. Hentley

Ms. Edie E. Hentley
Data Manager/Biologist
NH Natural Heritage Inventory

NAME	COMMON NAME	STATE RANK	GLOBAL RANK
<u>SALIX LABRADORICUM</u>	<u>LABRADOR REDSTRAW</u> *	✓ S2	B5
<u>SOUTHERN NEW ENGLAND CALCAREOUS SEEPAGE SWAMP</u>	<u>SOUTHERN NEW ENGLAND CALCAREOUS SEEPAGE SWAMP</u>		
<u>CLEMYS GUTTATA</u>	<u>SPOTTED TURTLE</u>	S3	B5
<u>VULPIA OCTOFLORA VAR TENELLA</u>	<u>SLENDER 8-FLOWERED FESCUE</u>	S3	U
<u>CALLITRICH ANCEPS</u>	<u>NORTHERN WATER-STARGWORT</u> *	SH	B5
<u>CAREX GRANULARIS VAR HALEWED</u>	<u>A SEDGE</u> *	SH	B5T3?
<u>LAMPETRA APPENDIX</u>	<u>AMERICAN BROOK LAMPREY</u>	S1	B5
<u>JUNCUS SECUNDUS</u>	<u>ONE-SIDED RUSH</u>	✓ S2	B5?
<u>ARABIS MISSOURIENSIS</u>	<u>MISSOURI ROCKCRESS</u>	✓ S2	64G5
<u>CLEMYS GUTTATA</u>	<u>SPOTTED TURTLE</u>	S3	B5
<u>ACALYPHA VIRGINICA</u>	<u>THREE-SEEDED MERCURY</u>	✓ S2	63G5
<u>GERANIUM CAROLINIANUM</u> * VAR <u>CAROLINIANUM</u>	<u>CAROLINA CRANESBILL</u>	✓ S1	U
<u>CAREX CRISTATELLA</u>	<u>SMALL CRESTED SEDGE</u> *	✓ S2	B5
<u>GLYCERIA ACUTIFLORA</u>	<u>SHARP FLOWERED PAMA-GRASS</u> *	✓ S2	B5
<u>ARDEA HERODIAS (Ardea Herodias) Rookery</u>	<u>GREAT BLUE HERON (ROOKERY)</u> *	S3	B5
<u>LYSIACHIS THYRSIFLORA</u>	<u>TUFTED LOOSESTRAFF</u>	✓ S2	B5
<u>CAREX BEBBII</u>	<u>BEBB SEDGE</u>	✓ S2	B5
<u>EMYDOIDEA BLANDINGII</u>	<u>BLANDING'S TURTLE</u>	S3	B4

* On Lamprey

*Excerpt from Garrett E. Crow (UNH -Hogdon Herbarium)
Dec. 13, 1979 Report:*

"RARE AND ENDANGERED PLANTS of NEW HAMPSHIRE
TOWN OF LEE
SPECIMEN RECORDS"

SITE: LAMPREY RIVER

GALIUM LABRADORICUM (Endangered)

THE NUMBER OF TAXA FOR THE SITE: LAMPREY RIVER IS 1.

SITE: WADLEIGH FALLS

CALLITRICHE ANCEPS (Threatened)

CAREX CRISTATELLA (Threatened)

GLYCERIA ACUTIFLORA (Endangered)

HABENARIA FLAVA, Var. HERBIOLA

THE NUMBER OF TAXA FOR THE SITE: WADLEIGH FALLS IS 4.

TOTAL RARE AND ENDANGERED LAMPREY PLANTS: 5



STRATEGIES FOR PROTECTING LANDS

Land can be protected by either acquiring the property itself, or by leaving the ownership of the land with its property owner and acquiring only the development rights or a conservation easement on the parcel.

Land acquisition by purchase

The most secure protection of the land comes from ownership. Purchase of the land by the town's conservation commission, one of several state agencies, or a public or private land trust can assure preservation. Outright purchase at fair market value is sometimes possible if local funding is made available, with or without matching funds from federal or state agencies.

Communities can form a joint project for a given corridor (eg., the Lamprey River corridor). Then a donation of land in one part of the corridor can be treated as the local match for government funds needed to purchase land in another part of the corridor (even if the parcel lies in another town).

Land acquisition by gift

Some landowners may realize significant income tax advantages by donating or selling property at a reduced price. For example, one way of reducing the capital gains tax from the sale of a piece of property is to give a portion of it to a conservation group. This is particularly significant under the new tax laws, for now capital gains must be taken in one year instead of being spread over a number of years.

The bequest of land in an owner's will can often reduce or eliminate estate taxes. Bequests also allow the owner to retain land during his lifetime in case of an emergency need to liquidate it.

Some landowners may also be enthusiastic enough about a well-planned and -presented conservation effort to contribute land without tax gains as a motivation.

Whenever land is donated or sold to a conservation group or municipality, the landowner must decide whether, and under what restrictions, he wishes the recipient to be able to sell the property in the future. Unless this has been spelled out in the agreement, some conservation groups sell donated parcels which they do not consider important to their goals in

order to finance the purchase of more desirable land. The same could happen to land obtained by a town. The landowner may be willing to have his land used this way, but if he feels strongly about preserving it in an undeveloped state, provisions must be made for that.

Acquisition of easements or development rights

Land can also be protected by the landowner's either selling or donating easements or development rights. While providing less tax advantage, this method allows owners to retain the land and to use it for agriculture or forestry. It is much more binding than the sale of land with restrictive covenants. (There have been many instances when the purchaser was subsequently able to obtain release from covenants.)

Protection through zoning

Some land can be protected by zoning if it can be shown that the motivation is to protect the health, safety and welfare of the community at large. Wetland and Shoreline Zones are examples of this. Cluster zoning, where part of the development is set aside as open space, may not always result in the appropriate land being conserved. It is up to the conservation commissions and planning boards to assure that the open space planned is meaningful.

In approaching the problem of acquiring land locally, there is no substitute for approaching landowners directly. Each has his own interests, constraints and balance of priorities which affect the type of arrangement most appropriate to his situation.

The Society for the Protection of N.H. Forests and the Trust for N.H. Lands (new office staffed by Roberta Jordan on Center Street in Exeter, Tel. 778-0504) can give advice on various options. The N.H. Association of Conservation Commissions (224-7867) keeps abreast of various programs and the money currently available through them.

Resources for Conserving Land

Agencies Providing Matching Funds

N.H. Department of Resources and Economic Development
(The Land And Water Conservation Fund.)

Matching grants for state and local acquisition of open space for conservation and recreation. 50% federal funds/50% local. Limit on the federal share is \$35,000 per community.

N.H. Fish and Game Department 75%/25% federal/local matching grants to acquire land primarily valued for waterfowl nesting or boat landings. Land is managed by Fish and Game. Must be accessible to hunters.

Trust for N.H. Lands The Land Conservation Investment Program provides state funds for a 50% match with local funds for key pieces of land.

Matching Funds for Acquiring Development Rights

Trust for N.H. Lands provides up to 50% match to local funds

N.H. Department of Agriculture provides funds for preservation of farmland.

Organizations Accepting Gifts of Land or Easement (funds may also be available for purchase of select parcels)

Local Conservation Commissions Audubon Society of N.H.

N.H. Fish and Game Trust for N.H. Lands

The Nature Conservancy University of N.H.

For further information, consult **Land Protection and the Tax Advantages for N.H. Landowners** available from the Society for the Protection of N.H. Forests at 54 Portsmouth St., Concord 03301 (Tel. 224-9945).

Sept. 1989 John W. Hatch
G

A SUMMARY HISTORY OF THE LAMPREY RIVER

The scope of this report is confined to the fresh water portion of the Lamprey River within the towns of Newmarket, Durham and Lee. This is a small section of a river system that flows over sixty miles, draining most of southeastern New Hampshire and emptys into the salt water of the Great Bay estuarine system at Newmarket.

This section of the river has been found to be rich in early history. Archaeologists have recently established pre-history habitation that reaches back over 8,500 years. On an island below Wadleigh Falls, Professor Bolian found artifacts and remains which dated this early occupation.* Much more remains to be done on this and other sites along the river corridor to give a clear picture of these early inhabitants.¹

Originally called the Pascassick by the Indians, the Lamprey name was firmly established by the 18th C. The early colonists referred to it variously as; Lamprill, Lamper-eel, and Lampreel - all in reference to the Lamprey eel still found here.

The original dam at the "fall-line" in Newmarket, called the lower falls, was built by Valentine Hill of Durham - "granted in 1652 for setting up a sawmill or mills." Hill had already established a dam and mill on the Oyster River in 1650. In 1655, he started construction on a canal that connected the two waterways along the present route 108 by way of the moat and Longmarsh Brook - "probably the first canal in New England." This canal was to have enabled him to supply power to his Durham mill at the low water time of the year on the Oyster River.²

The present dam at Newmarket marks the site of Valentine Hill's 17th C. dam, however the next dam site upstream, called the "second falls", has long since disappeared. Located at the present rapids adjacent to Richard Lord's home and Highland House on Bennett Road in Durham stood the Sullivan Mills. General Joh Sullivan, of Revolutionary fame, is reported, by John Adams (afterwards President of the U.S.) in 1774, to have "a fine stream of water with an excellent corn-mill, saw mill, fulling mill, scythe-mill, and others, six mills in all which are both his delight and profit." No archaeology has been done on this site to my knowledge.³

Just above these rapids is Packer's Falls, the site of the Packer's Falls dam just downstream from the present Packer's Falls bridge. Colonel Thomas Packer, along with four others, was granted in 1694..."the hole streame of Lamprele River for the erecting of a saw mill or mills." In the last part

of the 19th C. this dam was still in use as a saw mill and, by the Newmarket Manufacturing Company, a machine shop making farm tools. The Town of Durham now owns this site and has barely started archaeological investigation.

Less than a half mile above Packer's Falls is the existing Wiswall dam, also owned by the Town of Durham, and the site of Wiswall Mills which produced wall paper, among other things, in the last century. Originally called Wiggins Mills, it was acquired by Thomas H. Wiswall after he and a partner purchased it in 1857. The extensive paper mill was totally destroyed by fire November 1, 1883 and was acquired by the Newmarket Electric Light, Heat and Power Company in 1899. This company generated the first electric lights in Durham in February 1900. Some archaeological digs have been conducted here which reveal 19th C. artifacts, colonial material and evidence of ancient Indian occupation that should be more thoroughly investigated. 5

At the top of the great hook in the Lamprey River, just down stream of the bridge on Lee Hook Road, is Hill's Falls site of Hill's Mills. The Lee Hook Bridge, which was originally called Hill's Bridge - probably because the area where he built the mill was the natural fording place necessitating his building a bridge. Used as a shingle mill and grist mill and later as a saw mill in the late 19th C. This site has returned to its original state as rapids over a shallow. 6

The last dam in this survey is the Wadleigh Falls Dam, called the "upper falls", just below the bridge at the right angle turn on the present Rt. #152 in southern Lee. The original 1657 grant was made by the "...authorities of Massachusetts Bay to Samuel Symonds.....in the presence and with the consent of Moharimet, the Indian Sagamore of this region." Robert Wadleigh acquired the falls and had a saw mill here as early as 1668. A saw mill and a grist mill were in operation in the late 19th C. and also at the mill was the post office for the cluster of houses around the falls. At present, the dam is still standing although greatly deteriorated. Just below this dam is the island on which Professor Bolian has made his important find of early archaic and mid archaic remains.

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An Early Holocene Site in SE NH - The Wadleigh Falls Site
- 1. Jeffrey Mayman - 1983
A Preliminary Cultural Survey of the Lamprey River Drainage
- 2. Mary P. Thompson - 1892
Landmarks of Ancient Dover p.120 & p 58"....1655, he obtained free liberty to cut through the commons for drawing part of Lamperele River into Oyster River for the supply of the mills"
- 3. Ibid, p 247
- 4. Ibid, p 190
- 5. Ibid, p 272
- 6. Ibid, p 100
- 7. Ibid, p 262
- Stackpole, History of Durham, p 309

JUN 18 1986

CULTURAL RESOURCES REVIEW,
WISWALL FALLS, DURHAM, N.H.

REPORT PREPARED FOR
THE TOWN OF DURHAM

BY
VICTORIA KENYON
ARCHEOLOGICAL CONSULTANT

JUNE 13, 1986

INTRODUCTION

Preliminary cultural resources review has been completed the Wiswall Dam area of the Town of Durham, New Hampshire. The area studied includes only the portions of the Wiswall Falls area where construction for a hydro-electric facility has been proposed by the Town.

Proposed development of Wiswall Falls as a hydro-electric facility involves complete excavation and removal of materials on the east bank of the Lamprey River above and below the existing at Wiswall Falls. The study area is defined by both natural cultural features. (Figures 1 and 2). The area is bounded on the west by the Lamprey River. The eastern limit is defined by the mill canal and raceway wall and adjacent gravel road. The dam and gate bisect the project area. The area is a wooded river terrace, separated from the natural terrace by the mill canal.

Archeological study was initiated at the request of The Town Engineer. Research and field investigation was completed by the Consultant, and two trained archeological field crew. Authorization to proceed with work was received on June 10, 1986. Field work research and reporting were undertaken from June 11 to June 13 to meet the deadline requested by the Town Engineer. Methods employed to evaluate the cultural resources potential of the study area reflect the limited time permitted to work

This report identifies archeological resources to be affected by proposed construction. Interpretations are based on the results of limited field investigation and cursory examination of secondary archival sources. This report contains a description of historic

and prehistoric use of the Wiswall Falls area within its cultural context, study methods used and results of archeological survey.

BACKGROUND

Wiswall Falls are one of several natural falls along the Lamprey River which have been inhabited by humans for thousands of years. The Falls constitute the third major drop in the river above Newmarket. Newmarket is the location of the first falls, the Lamprey River Falls, which mark the separation of tidal or estuarine waters from fresh water. Above these falls lie Packers, Wiswall, Long, Hook-Island, Dame and Wadleigh Falls (Thompson 1965:119-120). Wadleigh Falls are the upper most falls along the Lamprey River. The Lamprey River flows from Northwood through several towns until it becomes a tidal river in Newmarket and enters Great Bay. The river is fed by several smaller streams including the Pawtuckaway, North and Little Rivers. The Pawtuckaway Pond was created historically to insure water for power at mills downstream (Figure 3).

The Lamprey River was inhabited throughout the prehistoric past. Sites have been recorded along the river, streams and falls and include components dateable to both the Archaic (8000-2500 B.P. and Woodland (2500-400 B.P.) periods of regional prehistory. In Newmarket, an Indian village and burial ground existed on either side of the Lamprey River Falls (George 1932: 8-9). Excavations at Wadleigh Falls Island have revealed a multicomponent stratified prehistoric site with a discrete Middle Archaic stratum (Pope 1981 Skinas 1981). A radiocarbon date of 8630 +/- 150 B.P. from the site places it among the earliest dated components in the State (Bolian personal communication). The river provided a travel and communication

route for prehistoric populations. The river was also a source of food resources, particularly anadromous fish and areas such as falls or rapids where fishing would have been good, should be expected to exhibit multiple occupation sites see Kenyon and McDowell 1983). Further, access to the coastal and estuarine environment would have been relatively easy along the Lamprey River thereby insuring a high energy return from a diverse resource base

During the historic period the Lamprey River was an important natural feature which helped to shape the commercial and industrial growth of Newmarket and adjacent towns. The earliest historic settlement in the vicinity was on the Squamscott River in the town of Newfields, dated to 1639. However, by 1647 a sawmill was built on the first falls of the Lamprey River in Newmarket (George 1932). By the 1640's, colonial settlers had also arrived at Oyster River Durham and in 1649 Valentine Hill built what is believed to be the oldest house in Durham, initiating the period of colonization (Hiatt 1979).

Colonial settlement, early commerce and industry exhibited parallel development in the towns of Durham and Newmarket. In both towns, the location of early growth was at the first river falls on the Oyster and Lamprey Rivers. Mills, shipyards, landings and stores grew at these locations providing centers for commercial and social relationships among the residents (George 1932; Stackpole et al 1913). An integrated economy developed; raw materials for manufacturing were transported from interior reaches of the river valleys, finished products were shipped to the coast by gundalow and special manufactured items were transported back from coastal centers. The centers of Newmarket and Durham grew around the first

falls based on industrial and commercial ventures. The economic focus of Newmarket remained centered on industry at the falls throughout the nineteenth and twentieth century. Durham exhibited an economic shift in the 1840's when the railroad was built some distance from the center of town and in 1893 with the creation of the Agricultural College. Durham became agricultural rather than industrial and the center of town activity moved away from the falls (Kenyon 1983)

The history of Wiswall Falls is integrated with both Durham and Newmarket historical developments by virtue of its political setting within Durham town limits and physical setting on the Lamprey River. The trend for industrial growth, based on utilization of local, natural resources, began as early as 1647 when authorization was given to Elders Nutter and Starbuck to build a sawmill on either the upper or lower falls of the Lamprey River (Thompson 1965:120). In 1652, Valentine Hill had a grant of mill privileges on the river with timber rights on either side of the river (Stackpole et al 1913:71; Thompson 1965:120). In 1718 the "hole streame of Lamprele River for erecting mills" was sold to Captain Thomas Packer (Wilcox 1976:5; Thompson 1965:190-191) and industrial development began in earnest at Packers Falls. In the mid 1700's, Packers Falls grew as an industrial and social center with mills and dam, a bridge, roads and public school (Thompson 1965:191) (Figure 4). The erection of six mills, including a corn mill, sawmill, fulling mill and scythe mill, at Packers Falls by Gen. John Sullivan in 1770, attests to the diversity of local industry and resourcefulness of developers (Stackpole et al 1913:135)

While activity may have occurred at Wiswall Falls prior to the

nineteenth century, the first clear construction date is 1835.

At this time Moses Wiggins built a dam and sawmill (Stackpole et al 1913:307-308). Wiggins also built a grist mill and paper mill, including two-story buildings. The second floor of one sawmill was used by a Mr. Talbot to manufacture gingham cloth

blankets. A variety of items were manufactured at Wiggins Mills including shoes, knives, hoes, pitchforks, wooden measures nuts, bolts, bobbins, ax handles, hubs, carriages, sleighs, chairs matches and spokes (Stackpole et al 1913:307-308). In 1854, Wiggins built the canal and moved a machine shop from Newbury which became the original paper mill at the location (Stackpole et al 1913:308). Buildings were leased by Wiggins to Thomas H Wiswall and Isaac Flagg, Jr. and later, Flagg sold his holdings to Howard Moses, who in turn, sold to C.C. Moses (Stackpole et al 1913:308). In the estate of Moses Wiggins, mills were conveyed to Joshua Parker and T.H. Wiswall in 1857 (Thompson 1965:272). Over time Wiswall acquired all mills at the falls (Thompson 1965:272; Stackpole et al 1913:308)

During the mid 1800's The Wiswall Mills were said to be "the busiest spot in town" (Stackpole et al 1913:309). This coincides with an economic shift away from the first falls on The Oyster River in Durham (Kenyon 1983) and a growing agricultural market in Durham. The Wiswall Mills included a number of components beyond the primary mill structures. The canal and paper mill were added in

(the paper mill measured 30 x 80 feet) and additions were made including an el (15 x 20 feet) and a stock house 30 x 50 feet). In 1868 a new dam was built, houses for workers were in use and a company store was kept by Austin Deog (Stackpole et al 1913:308)

(Figures 5 and 6). In 1883 the paper mill and all adjacent buildings burned leaving the dam and sawmill to continue operation (Stackpole et al 1913:308) (Figure 7). The site and orientation of these buildings are indicated in several published photographs (Figures 5, 6 and 7). Figure 6 may predate the 1883 fire rather than correspond to the 1885 date assigned by Adams (1976:83). The photo clearly shows the complex arrangement of buildings storage yards, outdoor work areas and paths at the mill complex. In 1896 a freshet washed out a portion of the dam (Stackpole et al 1913:308). In 1899 the function of the dam changed with purchase of the privilege by James W. Burnham, who established the Newmarket Electric Light, Heat and Power Company (Stackpole et al 1913:308 Wilcox 1976:19). The concrete dam and gates visible today were built in 1912 (Stackpole et al 1913:308; Wilcox 1976:19)

ARCHEOLOGICAL STUDY METHODS

Archival research was completed using secondary sources. While such primary sources as tax maps, wills or probate records, personal diaries or correspondence, ledgers, newspaper articles, insurance maps and deeds undoubtedly exist for the Wiswall Falls area, time did not permit their pursuit. Secondary sources have provided a chronology of historic use at Wiswall Falls and have suggested that multiple cultural resources may exist at the location. Such resources include prehistoric components and industrial loci associated with construction and operation of mills. Yards, roads, housing and a store may be recognized in addition to mill, shed, canal and dam remains. Artifactual remains may range from personal items of workers to architectural elements,

to manufacture waste to machinery. A single prehistoric archeological component, NH40-10, had been recorded at Wiswall Falls in the Statewide site survey files of the New Hampshire Archeological Society

Archeological field investigation was tailored to fit the available time schedule and to answer specific questions on the nature of Wiswall Falls. Field investigation included walkover survey and limited subsurface testing in the project area. Walkover survey was undertaken to complete a sketch map of historic features clearly visible on ground surface. These areas were not sampled with subsurface techniques. Surface survey was also completed along the water line to define the presence of prehistoric site NH40-10. The primary objective of surface inspection was to define visible features and recent disturbance. Testing was designed to examine subsurface intactness in the study area. Tests provided information on fill, disturbance or intact strata representative of either historic or prehistoric activity episodes. Testing permitted definition of the presence of intact archeological deposits. Testing did not seek to define horizontal limits of such deposits.

A total of six shovel tests was excavated in the project area. These were judgementally placed in various areas of the project (Figure 8). A single test (#5) was placed north of the dam on river terrace to identify any disturbance by filling completed by the town several years ago. This test also was placed to locate prehistoric deposits above the natural falls. A transect of 3 tests (#1, 2, 3) was placed on the terrace between the river and canal below the dam to identify any fill or disturbance in the

central mill area. A single test (#4) was placed on the east side of the canal to identify historic building remains, features, or disturbance. A single test (#6) was placed at the southern edge of the study area to identify historic features, fill disturbance or prehistoric remains.

Tests were excavated by shovel and measured at least 50 cm in diameter. One test (#4) measured 84 cm. in diameter to expose historic materials. Tests were excavated deeply enough to define fill, disturbance or intact layers (see Table 1). Tests #5 and #6 were excavated to depths in excess of 1 m to recognize any deeply buried prehistoric cultural remains such as those discovered at Wadleigh Falls (Pope 1981; Skinas 1981). All soils were excavated by natural level and were screened through quarter-inch mesh. Notation was made on soil color and texture. Artifacts were recorded by level

RESULTS

Surface survey and subsurface sampling has revealed the presence of a variety of archeological deposits within the Study area.

Surface survey confirmed the presence of NH40-10 on a low alluvial beach at the tail of the natural falls. Lithic flaking debris eroding from the bank was collected here. The beach is littered with modern trash from beer drinkers but the subsurface context of the site does not appear to be affected. Erosion is affecting the bank here however.

Surface survey identified historic architectural features associated with the Wiswall Mills (Figure 9). On the north side the dam the head race is clearly visible but filled and blocked.

Foundation stones between the river and head race may reflect the sawmill and grist mill location (See Figure 7). South of the dam is the tail race canal, a deep and impressive feature of dry cut masonry. At its northwest edge, adjacent to the dam is a small foundation. At its southeast edge is a deep cellar hole. South of the tail race are foundation remains, piles of cinders and a rubble mound of brick and cinders. A brick foundation adjacent to the rubble may be a portion of the ell to the paper mill (See Figure 5). A depression in the southeast region of the study area may correspond to the 30 x 50 foot stock house. A drainage ditch crosses the land beyond this feature. Survey did not extend to the eastern side of the gravel road; other features corresponding to buildings and yards may be found here (See Figure 6)

Subsurface sampling has defined prehistoric and historic deposits. A prehistoric component was recognized by artifactual remains in intact subsoil in test #5. These remains include three lithic cores, suggestive of lithic reduction activities. One core is of quartz, a locally available material. The other two cores are Saugus Jasper, a volcanic rhyolite visually recognizable by its red matrix and white flow bands. This material was quarried at Saugus, Massachusetts. Its appearance on the Lamprey River suggests the existence of prehistoric trade, exchange or interaction between the two regions. It is noteworthy that cores not finished or curated tools, appear in the Lamprey River context. Because cores are not temporally diagnostic, no chronological assignment is ventured for this context.

Historic activities are reflected in subsurface contexts. Test #5 exhibits a dark brown plowzone from 6 to 25 cm below surface.

Plowscars were recognized during sampling. This indicates that agricultural activity was practiced at the falls at some time during the historic period. Other stratigraphic data reflect events associated with industrial growth. An intact stratigraphy, with original topsoil at 32-36 cm, was noted beneath historic fill in test #6. Burned lenses were recognized in several tests and may reflect the fire of 1883 which destroyed most of the buildings. Tests #1, 2 and 3 exhibited disturbed fill probably associated with excavation of a builders trench to construct the canal. Portions of intact stratigraphy were suggested in the west profile wall of test #2. Test #4 revealed a flat cobble pavement and boulder. These stones probably represent the floor and wall of a structure. One paving stone measured 16 cm x 17 cm x 4 cm. Testing revealed four interlocked paving stones in the bottom of the excavation unit at 30 to 36 cm below surface.

Evidence from testing suggests that architectural remains may be revealed by archeological excavation. Excavation may also uncover deposits which reflect actual building construction techniques, function and demolition. Limited sampling has verified the presence of intact loci.

SUMMARY

Limited field investigation has verified the presence of intact prehistoric and historic archeological deposits within the Wiswall Falls study area. Because work was restricted to the project boundaries, the full extent of archeological deposits has not been defined here. Remains, as predicted from documentary research, reflect a diversity of past human activities at the location.

IMPACT

Construction planned by the Town of Durham involves excavation of materials on the eastern bank of the Lamprey River above and below the Wiswall dam. This construction would have a permanent detrimental effect on archeological remains. One prehistoric component would be affected. A number of historic features including several foundations, the canal and subsurface architectural elements would also be affected. Resources outside the immediate project area may also be affected. Prehistoric site NH40-10 may be eroded or altered by changes in river flow. Historic features outside the study area may be damaged by stockpiling, timbering, or traffic associated with excavation.

Development of a data recovery plan for primary and secondary impact areas is desirable. This should include extensive archival research using primary sources to develop testable hypothesis on social and economic change in a multi-faceted industrial setting. Excavation to expose buried loci and mapping of visible features would provide data to test expectations. Seventeenth, eighteenth and nineteenth century remains may be discovered in intact contexts.

An alternative to archeological data recovery may include project redesign to avoid cultural resources thereby preserving them in place.

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TABLE

SHOVEL TEST STRA RAPHY AND AR IFACT

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Test #	Depth of Strata (cm below surface)	Soil Characteristics	Artifacts
	6 - 25	dark brown sandy loam	quartz core
	25 - 48	yellow brown sand	Saugus Jasper core
	48 - 84	yellow brown sand	Saugus Jasper core
6	0 - 21	loose black sand	cinders, nails glass, brick
	21 - 27	compact gray silt	none
	27 - 32	burned lens	none
	32 - 36	dark brown loamy sand	none
	36 - 107	yellow brown sand	none
	107 - 130	yellow brown sand	none

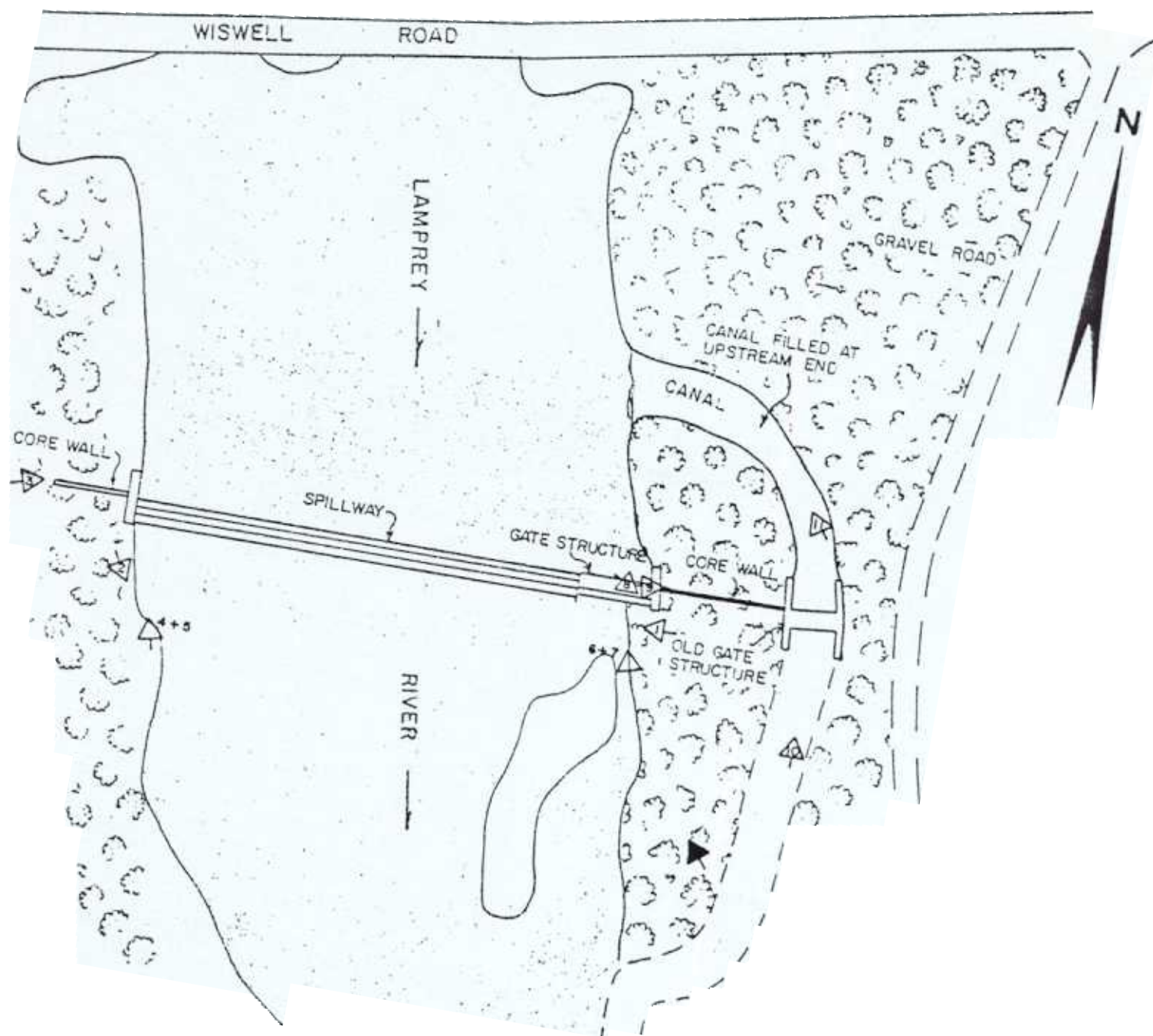


Figure 1. Wiswall Falls Location

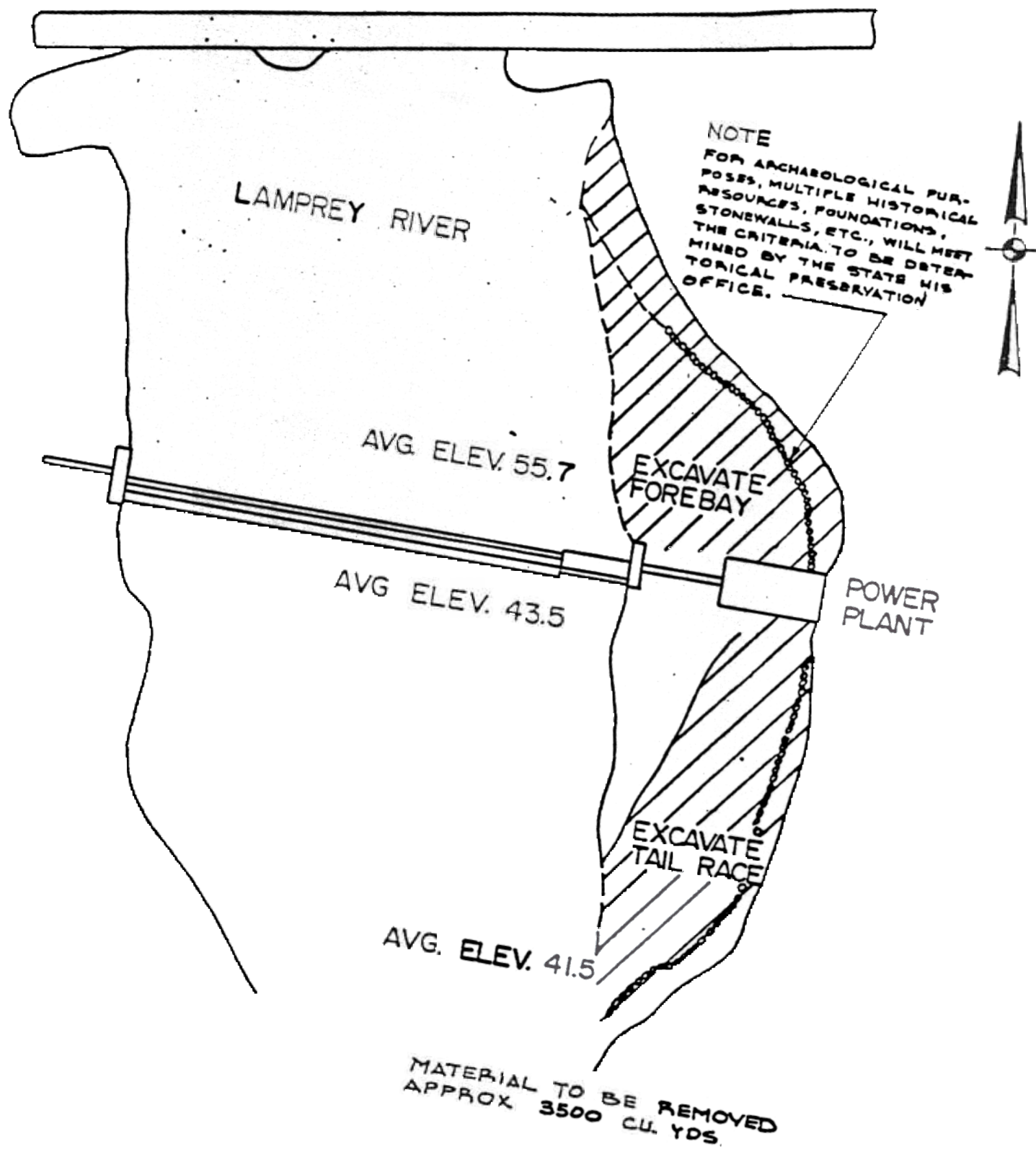


Figure 2 Wiswall Falls Study Area

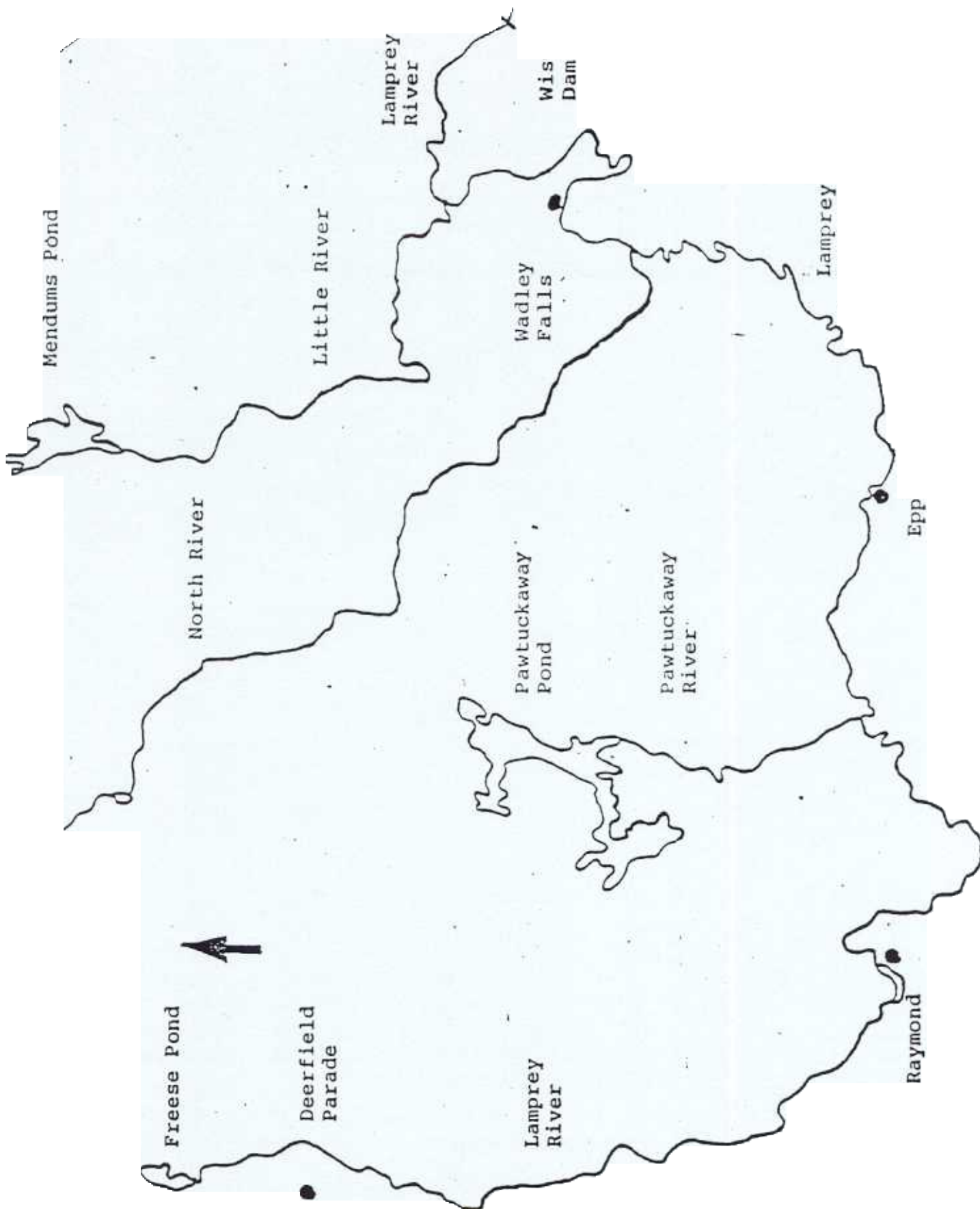


Figure 3 Lamprey River

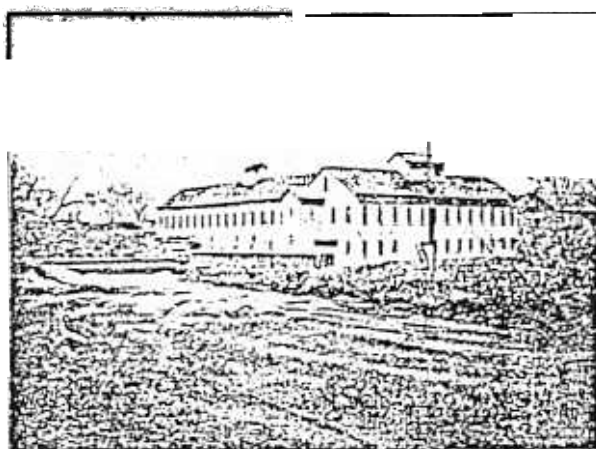


Figure 1. Wiswall Paper Mill (After Stackpole et al. 1913: 308)



Figure Wiswal Mi About 1885 (After Adams 976 83)

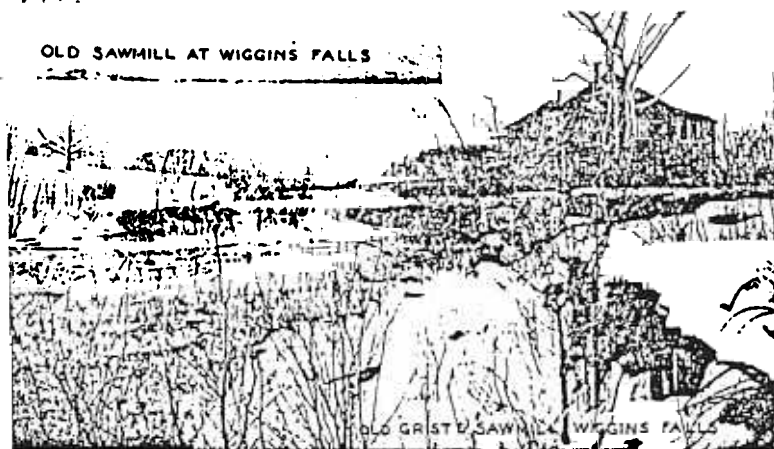
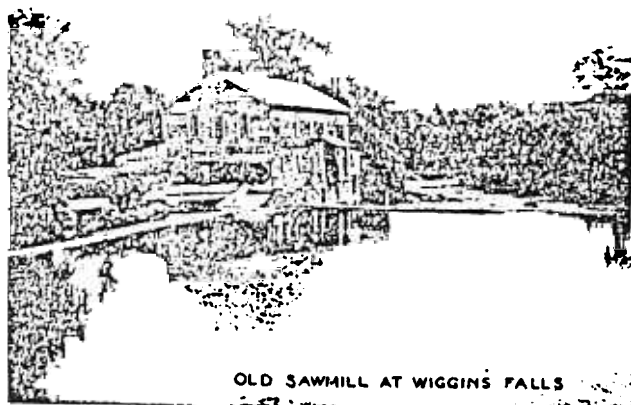


Figure 7. Sawmill and Gristmill (After Stackpole et al 1913:306)

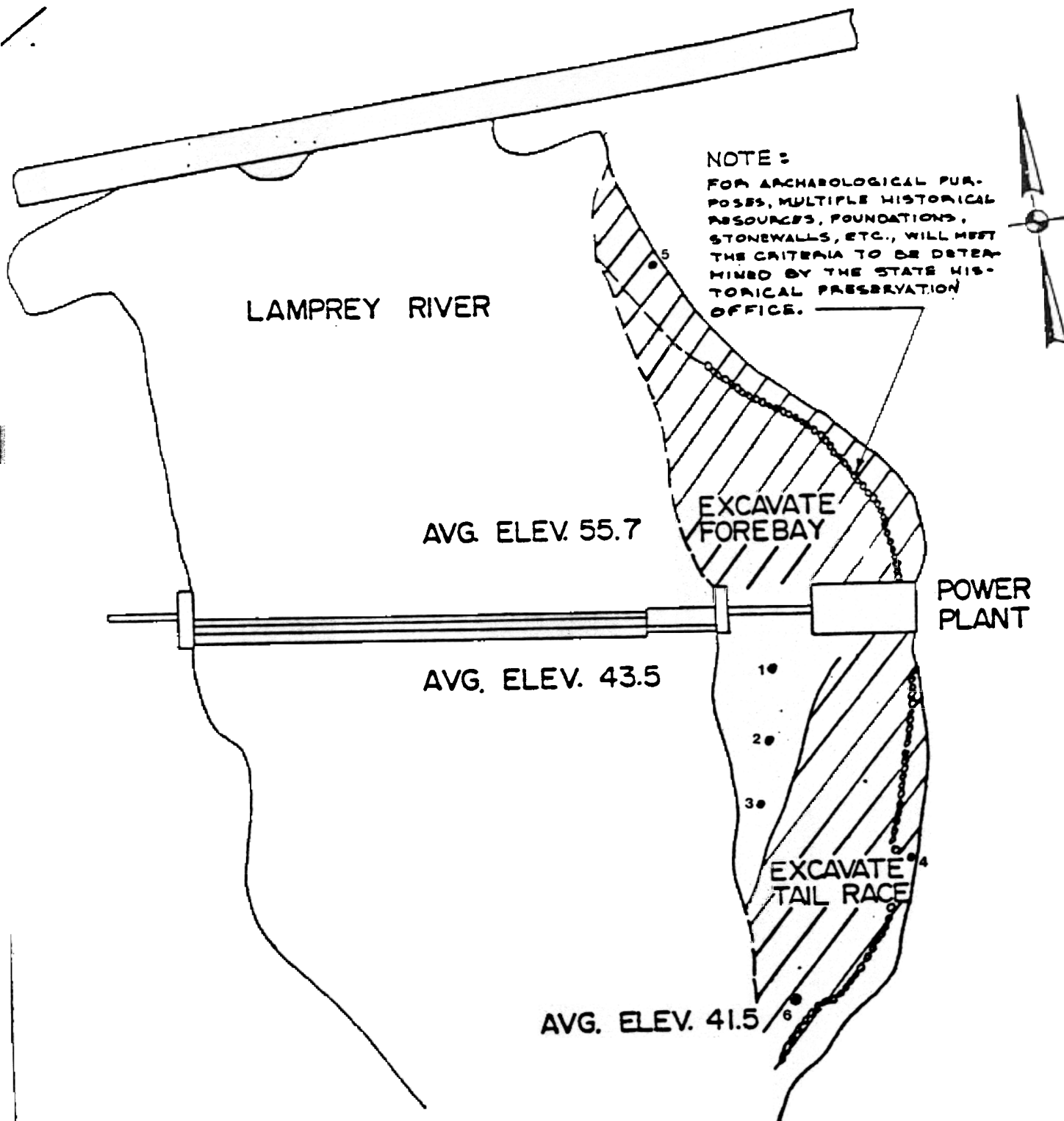


Figure 8. Shovel Test Pit Locations

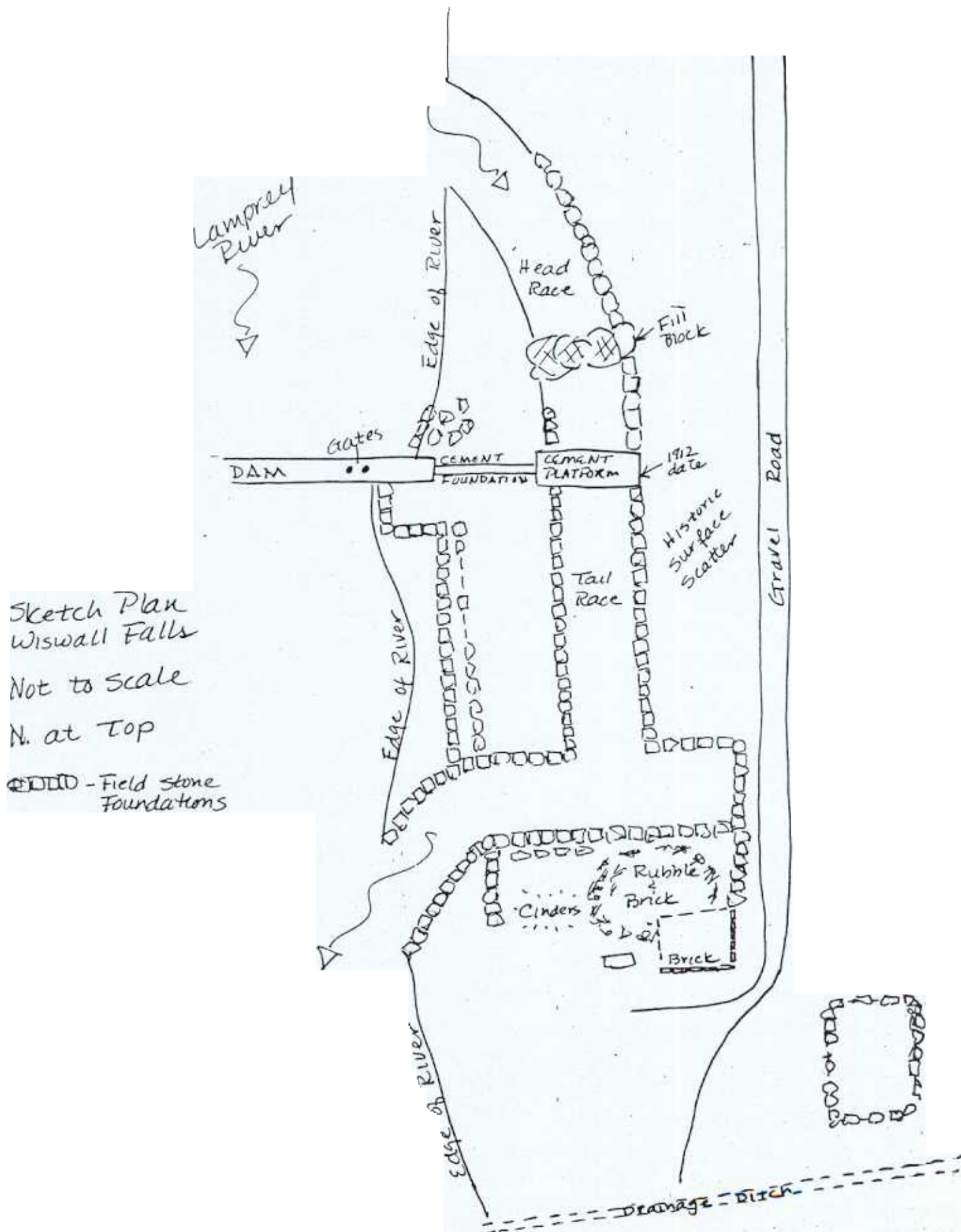


Figure 9. Sketch Map of Surface Features

United States Department of the Interior
National Park ServiceNational Register of Historic Places
Registration Form

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

1. Name of Property

historic name WISWALL FALLS MILL SITE

other names/site number _____

2. Location

street & number Wiswall Road at Lamprey River☐ not for publicationcity, town Durham☐ vicinitystate New Hampshire code 33 county Strafford code 017 zip code 03857

3. Classification

Ownership of Property

- ☒ private
☒ public-local
☐ public-State
☐ public-Federal

Category of Property

- ☐ building(s)
☐ district
☒ site
☐ structure
☐ object

Number of Resources within Property

Contributing

Noncontributing

1

buildings

sites

structures

objects

10 Total

Name of related multiple property listing: _____

Number of contributing resources previously
listed in the National Register 0

4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this
☐ nomination ☐ request for determination of eligibility meets the documentation standards for registering properties in the
National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60.
In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of certifying official _____

Date _____

State or Federal agency and bureau _____

In my opinion, the property ☐ meets ☐ does not meet the National Register criteria. ☐ See continuation sheet.

Signature of commenting or other official _____

Date _____

State or Federal agency and bureau _____

5. National Park Service Certification

I, hereby, certify that this property is:

- ☐ entered in the National Register.
☐ See continuation sheet.
☐ determined eligible for the National
Register. ☐ See continuation sheet.
☐ determined not eligible for the
National Register.
☐ removed from the National Register.
☐ other, (explain:) _____

Signature of the Keeper _____

Date of Action _____

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WISWALL FALLS MILL SITE

cut through each, the 17th century settlements of Oyster River (now Durham) and Lamprey River Village (later Newmarket) developed, utilizing the falls for early saw and grist mills.

Key to the development of the mills at the Wiswall Falls site was the Lamprey River, one of several coastal rivers which are part of the Piscataqua Watershed, the only New Hampshire river system to drain into the Atlantic. The Lamprey drains an area of 210 square miles, about 25 percent of the Piscataqua watershed, and, in area, second only to the drainage area of the Salmon Falls River. From its two sources, in the towns of Northwood and Candia, the river meanders over thirty miles, before reaching Great Bay below Newmarket. In the mid-19th century, two water-supply reservoirs, the 3,000-acre Pawtuckaway Pond in Nottingham and the 250-acre Mendum's Pond in Barrington, were constructed by Newmarket interests to supplement the flow of the Lamprey during times of low water (Swain 1880: 63).

Between its sources and tidewater, the Lamprey descends over 1000 feet, and by the 1870s its improved waterpower was rated at over 1500 horsepower (Fogg, 589). Of this the largest single fall was at the head of tidewater, the Great Falls, at Newmarket. Here the Newmarket Manufacturing Company maintained a 20-foot high dam furnishing 350 horsepower to their cotton mills (Swain 1880: 63-64). The dam created a mill pond of the river for two miles upstream. At its upper end, in Durham, was Packer's Falls, a natural fall in the river, which had been improved for milling as early as the late 17th century. By 1880, however, it was an underutilized mill privilege owned by the Newmarket Manufacturing Company. Wiswall Falls, about 1300 yards upstream from Packer's Falls, was the second of the two mill seats developed on the Lamprey River in Durham, though it was not until 1835 that its waterpower potential was developed. Here, where the river fell over a natural granite ledge, a large wood-crib dam had been constructed. Rebuilt in 1868, the dam provided a 9-1/2-foot head of water, which was utilized by six separate water turbines in Wiswall's saw, grist, and paper mills.

Three separate archaeological investigations of the site were conducted in 1985 and 1986 in association with two licence applications to the Federal Energy Regulatory Commission: two by Charles E. Bolian and Jeffrey P. Maymon in 1985 and 1986, and one by Victoria Kenyon in 1986 (see bibliography). On the basis of a walkover survey and subsequent testing, Bolian and Maymon identified the above-ground remains of nine separate structures, here identified by the structure numbers they assigned. As part of their Phase II work in 1986, Bolian and Maymon conducted further subsurface investigations on structures 3 and 7 -- those structures anticipated to be impacted by the proposed hydroelectric development.

Structure 1 (Power Canal). The Wiswall Falls Mill Site is dominated by the power canal, constructed by Moses Wiggin in 1854 and the most intact feature in the complex. From an inlet about 85 feet north of the dam, the canal runs parallel to the river for approximately 235 feet. The canal is severed about 85 feet from the inlet by a concrete gate structure, evidently constructed in 1912. The inlet north of this structure appears to have been nearly completely destroyed, perhaps by bulldozing after the canal was retired from use to prevent the diversion of water through the canal. South of the gate

6. Function or Use

Historic Functions (enter categories from instructions)

INDUSTRY/PROCESSING/EXTRACTION

Manufacturing facility

Waterworks

Current Functions (enter categories from instructions)

VACANT/NOT IN USE

7. Description

Architectural Classification
(enter categories from instructions)

N/A

Materials (enter categories from instructions)

foundation N/A

walls

roof

other

Describe present and historic physical appearance

The Wiswall Falls Mill Site is a 3-acre historic archeological site located on the east shore of the Lamprey River in the southwest corner of the town of Durham, New Hampshire. It includes the physical evidence of nine separate structures, all related to the industrial use of the site between 1835 and 1883, initially by saw and grist mills, and later by a paper mill manufacturing wallpaper. The most prominent feature is the stone-lined power canal, 12 feet wide, 8-10 feet deep, and 250 feet long. Since the early 20th century, it has remained virtually undisturbed. The property remained in private ownership until it was sold to the town in 1965. The site has been the subject of Phase I and Phase II archaeological investigations in 1985 and 1986, indicating that significant portions of the site remain intact and that relevant archaeological information still exists which could provide insight into the history of the site and to aspects of the economic growth of the town of Durham. A brief overlying period of use as a hydroelectric site has not obscured the interpretive value of the complex. Documentary, as well as physical evidence indicates that the site is significant and possesses the necessary integrity to be nominated to the National Register of Historic Places.

The property is bounded on the west by the Lamprey River. On the north, it is bounded by Wiswall Road, a paved two-lane country road, with three 19th-century residences located on the north side of the road. There is no natural boundary on the east, a relatively level area of mixed deciduous and pine trees, a type of forest growth which now covers most of the site. A pine grove on the eastern boundary of the site, beginning fifty feet south of Wiswall Road, was evidently planted early in the 20th century. On the south, the property is bounded by the 135-foot swath cut by Public Service of New Hampshire for its 115-kv transmission line, installed in the 1920s. But for this clearing, most of the nominated property is overgrown with brush and small trees. A single-lane dirt track, probably the remains of the mill-access road, provides access to the site from Wiswall Road. Most of the site is flat, although the ground at the southeast corner of the property, including structure 8, rises with an outcrop of bedrock. The stone-lined power canal is the most intact structure on the site. There are no standing buildings; with the exception of the power canal, all of the "structures," described in more detail below, are building foundation ruins connected with the mills. As the mill buildings were all wood-frame structures destroyed in a fire in 1883, little above-ground evidence remains.

Durham is an inland town on the northwest shore of the Great Bay, an 11,000-acre tidal estuary which itself empties into the lower reaches of the Piscataqua River. It is a gently rolling landscape and has supported a substantial agricultural economy since the 17th century. Granite outcrops have provided foundation stone for local construction. Two rivers, the Oyster River, and the Lamprey, run through the town. Where the fall line

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structure, however, the canal is much better preserved, extending for 150 feet in a straight and southerly direction. Approximately 12 feet in width, and 8-10 feet deep, the walls are lined with dry-laid cut stone (local diorite). Two portions of the walls have been reinforced with concrete and one section rebuilt, probably during the renovation of the dam and headgates, about 1912. The headrace ended where the canal passed beneath the papermill, making a right turn as it passed through two turbines. Although no physical evidence remains of the turbines, the foundation walls of the original paper mill, 30x80 feet in plan, form part of the the southern leg of the canal as it returns toward the river. This tail race makes a dog leg as it extends first west and then south before merging with the river (see map).

Structure 2 (Sawmill). The sawmill, located adjacent to the dam on the river side of the island, was the earliest structure built by Moses and Issachar Wiggin in 1835, and all indications are that it remained standing at the site longer than any other structure, surviving the 1883 fire by at least thirteen years. Reportedly it was in operation until a freshet in 1896 swept away a portion of the dam (Stackpole 1973: 309). Two stories in height and 60x24 feet in plan, the mill was illustrated in Stackpole's history (Ibid.: 306). The photograph shows three windows and a log haulway in the 24-foot upstream elevation, which appears to have extended into the millpond upstream of the dam. Archaeology to date has revealed only a portion of this site. Bolian and Maymon write: "The western and southern margins of the possible building are indicated by the step in the dry-laid cut stone wall on the river edge of the island. A wall appears to be present on the eastern side, also, [although] most of it is buried. The fill does not extend to the top of the wall on the western margin, suggesting that a cellar exists. The dimensions, approximately 40x15 feet, do not match any of the historically documented structures in the mill complex" (Bolian & Maymon 1985). The sawmill, powered by two water turbines, must have been equipped with its own headrace (possibly shared with the grist mill), although no archaeological evidence for it has yet been uncovered.

Structure 3 (Paper Mill, East Foundation; hydroelectric plant). Documentary evidence indicates that this structure, located on the eastern side of the canal, at the corner of its outlet, is probably the eastern foundation of the 34x80-foot paper mill. Measuring 34 by 22 feet, the dry-laid cut stone foundation probably supported the eastern end of the mill, with the remaining 58 feet extending over the canal and supported by the canal walls. The presence of at least two different wall types suggests that the structure has undergone substantial modification. Most of the outer walls are constructed of large blocks of cut diorite, probably dating to the construction of the canal and paper mill. The later walls are of fieldstone, mortar, and occasionally brick and are thought to date to the construction of the hydroelectric facility built here in 1900 (Bolian & Maymon 1986). Brick and stone machine bases appear to be contemporary with the later construction. Ceramic and porcelain insulators collected from the surface support this dating hypothesis. Excavation of a pit (identified as S118W10) within the structure by Bolian and Maymon in 1986 revealed extensive evidence relating to the mill building which burned in 1883. At the bottom of the pit, a 2-3 inch layer of charcoal was disclosed, consistent with the remains of the 1883 fire. Subsequent demolition and/or decay of the remaining structural remains

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formed strata 5, 6, and 7. Bolian and Maymon reported that stratum 5 was rich in organic material, especially partially charred wood. Other cultural materials included bottle and window glass (much of it melted), ceramics, cut nails, bricks, mortar, and buttons. The uppermost strata contained considerable debris consistent with the use of the site as a dump, after the abandonment of the generating facility.

Structure 4 Boiler Room). "This structure is located on the southern side of the canal, adjacent to Structure 3. It is constructed of laid brick and stone. The masonry is poorly constructed, and one section of wall is approximately one foot wide and 2.5 to 3 feet high. A large piece of iron and a pipe were built into the wall. A large pile of brick rubble lies on the western margin of the foundation. The northern margin is marked by a nearby buried brick wall. The eastern margin is the only stone wall (?) and is also nearly completely buried. The north-south dimension ... is approximately 32 feet. This structure appears to have been constructed later than the early phase of structure 3, but earlier than the pads constructed on top of structure 2. The pile of brick rubble may be what remains of the smokestack. This hypothesis is supported by the large amounts of coal and slag found in the area and an iron furnace door panel in the brick rubble pile" (Bolian & Maymon 1985). The mill was never provided with a steam engine; the boiler was used in the paper drying process, and the top of the smokestack appears in the principal view of the mill taken about 1880 (Adams 1976: 83).

Structure 5 (Shingle Shed?). "This structure is located on the east side of the footpath, approximately 55 feet east of the canal. It is dug into the top of a slight rise which may be a historic feature. The low foundation measures approximately 24 by 18 feet and is constructed of field stone and cut stone. It is attached to the foundation of structure 6, which appears to be the older of the two. This might be the shingle shed which is listed as 18 by 28 feet in the advertisement for the auction of the mills in 1857" (Bolian & Maymon 1985).

Structure 6. "This structure is located on the east side of the footpath and is attached to the western wall of structure 5. This foundation cuts into the slight rise. The western edge of the foundation is open. This appears to be the result of robbing of a portion of the dry-laid stone foundation. The southern wall exhibits evidence of an entrance approximately four feet wide. The eastern wall is 24 feet in length. This structure does not fit any of the known building sizes, but may be a portion of one of the buildings since destroyed by stone robbing" (Bolian & Maymon 1985).

Structure 7 (Shed). This structure is located between structure 6 and the canal. It was uncovered during shovel testing in 1985, and was further defined by testing in 1986. Probing with a survey pin was later supplemented by opening three test pits, ultimately revealing portions of a building 14 by 41.5 feet in plan. These dimensions match best with the dimensions of a shed described in the 1857 mill auction notice. Substantial ash and charcoal was also uncovered, which is believed to relate the fire which burned nearly all of the buildings in the mill complex on November 1, 1883.

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Structure 8 (Stockhouse). "This structure is located [east] of structures three and four. It is on top a bedrock outcrop that rises from the footpath at least six feet. The foundation is defined by the edges of a blasted-out section of bedrock on the south and west sides. A few cut stones lie in a line along the southern boundary of the foundation. Near the middle of the area is a mound of earth which apparently formed the foundation wall between the two sections of the building. The photograph in Drowned Valley [Adams 1976: 83] appears to show a structure composed of two, 2-story buildings joined near the center. One roof is oriented north-south, the other east-west. The westernmost section of the building has a walk-in cellar corresponding to the deep cutout area of bedrock on the south and west sides of the structure. The size of this foundation is approximately 50 by 30 feet, the mound occurring at approximately the center, forming two 25x30 sections. This compares favorably to the dimensions given for the stockhouse (Griffiths n.d.)" (Bolian & Maymon 1986).

Structure 9. "This structure is located north and east of all the other known buildings in the mill complex. In the Drowned Valley photograph it is located in the left foreground. The foundation is partially covered and probably has been robbed for stone. Only the eastern portion of the foundation shows above ground. Probing suggests that the size of the foundation is approximately 16 by 18 feet. This does not correspond to any known building" (Bolian & Maymon 1986).

Prehistoric Occupation of the Site. The earliest archaeological activity at the site was the 1977 report of site NH40-10 in the New Hampshire state archaeological site files. The site, marking the discovery of a single "tan flint" flake, is located approximately 75 meters downstream from the nominated property. Surface surveys along the waterline by both Bolian (1983) and Kenyon (1985) showed large amounts of lithic flaking. Kenyon reported the discovery of lithic cores in a shovel test pit, while Bolian recovered twenty-four flakes in a single shovel test pit. At no time, however, was any diagnostic material recovered to allow a chronological assignment (Kenyon 1985; Bolian & Maymon 1985). Kenyon noted that prehistoric sites had been recorded at many areas along the Lamprey River, with components from both Archaic and Woodland periods. W

The mill site was in the same geological formation as NH40-10 and was consequently considered to have a high potential for the recovery of prehistoric material. Testing by Bolian & Maymon in areas of the property thought to be little disturbed, however, "indicated that although historic disturbance was relatively thin (28-39 centimeters; or 11-16 inches), there was no evidence of prehistoric occupation" (Bolian & Maymon 1986).

8. Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:

☐ nationally ☐ statewide ☒ locally

Applicable National Register Criteria ☒ A ☐ B ☐ C ☒ D

Criteria Considerations (Exceptions) ☐ A ☐ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)

ARCHEOLOGY

Historic -- Non-aboriginal

INDUSTRY

Period of Significance

1835-1896

Significant Dates

1835

1854

1883

Cultural Affiliation

N/A

Significant Person

Architect/Builder

Wiggin, Moses

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

The Wiswall Falls Mill Site possesses integrity of location, design, setting, materials, and association. The site is associated with events that have made a direct contribution to the industrial development of the town. For much of the 19th century, the site was the location of the town's most successful manufacturing industry, measured in terms of the number of persons employed, the value of product manufactured, and capitalization. Levelled by a destructive fire in 1883, the site has seen relatively little disturbance since that time. Today, the site is the best remaining example in Durham of the town's 19th-century manufacturing base. Limited excavations in 1986 have confirmed the subsurface integrity of the site, which holds considerable potential to inform us about the organization of a small paper mill and the hydraulic relationship of three competing mills. For its important role in Durham's 19th-century economy, and for the information potential that further subsurface investigation may yield, the Wiswall Falls Mill Site meets criteria A and D of the National Register of Historic Places.

Durham was initially settled at the fall line of the Oyster River in the 17th century, as Newmarket was settled at the fall line of the Lamprey River. In the 18th century, both communities thrived, with the benefit of a sheltered tidal estuary, adequate water power to operate small mills, a growing shipbuilding industry, and coastal commerce in ship timber and agricultural products.

Packer's Falls, two miles above Newmarket in Durham on the Lamprey, was developed in the 1770s by General John Sullivan with a series of six mills, including corn, saw, and fulling mills. What is today Wiswall's Falls, less than a mile upstream, would not see a similar development for another sixty years (Stackpole 1973: 307).

After the Revolution, Durham continued its expansion, in part encouraged by the construction through Durham of the first New Hampshire Turnpike (the present U.S. Route 4) in 1796, linking Portsmouth with the state capitol in Concord (Marston 1944: 56). From a population of 1,247 in 1790, Durham grew to a peak population of over 1,600 by 1830. Despite its subsequent decline, for much of the second quarter of the 19th century, Durham remained an economically active and thriving commercial community. Evidence for this can be seen in the new hydro development of Moses and Issachar Wiggin on the Lamprey River.

☒ See continuation sheet

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In Durham, as in other communities in the second quarter of the 19th century, the town witnessed a significant shift of industry away from smaller colonial millpowers like that on the Oyster River, to new locations with greater horsepower potential. At what soon became known as Wiggin's Falls, the two brothers established a small center of industrial activity. In 1835, they purchased the privilege above Packer's Falls and constructed the first dam and sawmill on the site, followed not long after by a grist and flour mill. The two-story buildings also provided quarters for other manufacturers. Gingham cloth was manufactured in the second story of the sawmill. Other industries carried on in these mills prior to 1857 were the manufacture of shoe knives, hoes and pitch forks; wooden measures; nuts and bolts; bobbins; axe handles; links; carriages and sleighs; chairs and matches (Griffiths; Stackpole 1973: 308). In 1850, Moses Wiggin's sawmill, valued at \$3,000, was the most heavily capitalized mill in Durham, producing over 600,000 board feet of lumber and ship timber annually. His own farm, valued at \$10,000, was the fifth most valued farm in Durham (Bolian & Maymon: 1985).

An auction notice in 1857 describes these two-story mills: the sawmill was reported as 60x24 feet in plan; the grist mill, as 50x24 feet. Stackpole in his History of Durham includes a distant view of both, indicating that the sawmill was further north than the grist mill, as the sawmill included a log haulway into the millpond (Stackpole 1973: 306). It undoubtedly sat astride the line of the dam. (Dotted lines on the site plan attached suggest a possible location for this structure.) The saw and grist mills were each powered by two water turbines, the sawmill turbines alone supplying 50 horsepower to the up-and-down saw and three small circulars (U.S. Census: 1870).

Moses Wiggin, and his brother Issachar until his death in 1844, owned the mills for a little more than twenty years. In 1853, Thomas H. Wiswall and Isaac Flagg, Jr., sons of partners in a successful Exeter paper mill, came to Wiggin's Falls, leasing the dam, mills, and water rights for \$350 per year. Evidently Wiswall manufactured paper in the sawmill for a short time (Biog. Review 1897: 414), but the lease stipulated that Wiggin would construct a canal and a new two-story paper mill, 34x80 feet in size with two water wheels (Bolian & Maymon 1985). The present 250-foot power canal was constructed the following year. Across the southern end, Wiggin set an old machine shop which he moved from Newmarket. The two-story shop was 80 feet in length and 30-34 feet in width (there is some dispute over the actual width). Wiggin leased the shop almost immediately to Wiswall and his new partner Howard Moses (to whom Flagg had disposed his interest).

At Wiggin's death in July 1856, his debts forced the sale of much of his property, and in May 1857 Wiggin's mills, water rights, and the paper mill lease to Wiswall and Moses were auctioned off. The three-quarter page advertisement in the Dover Enquirer announcing the auction provides the earliest and virtually the only documentary evidence of the building dimensions. In addition to the saw and grist mills already mentioned, it lists the paper mill (80x30 feet), "shed for planing and jointing" (40x12), a "shingle shed," (18x28 feet), and four acres of land. The mills were favorably situated with good connections to the outside world. The advertisement noted that the mills were 2.5 miles from Newmarket, one mile west of the line of the Boston & Maine Railroad, "and convenient of access by a good road."

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Thomas H. Wiswall (1817-1906), after whom the falls were named, was born in Exeter, New Hampshire, the son of Thomas and Sarah (Trowbridge) Wiswall. Thomas, Sr. was born in Newton, Massachusetts, where the family were also associated with the paper industry. Papermaking at Newton Lower Falls, begun by 1790, was subsequently responsible for its introduction elsewhere in New England (see Newton Lower Falls Historic District, Newton MRA-9/4/86). (The brother of Thomas H., Augustus C. Wiswall (1823-1880), owned paper mills in both Newton Lower Falls and briefly at Packer's Falls; A.C.'s son Clarence (1854-1942), also a papermaker, in his retirement wrote a history of the paper industry in Newton, One Hundred Years of Paper Making: A History of the Industry on the Charles River [1938].) Thomas H. worked in his father's Exeter paper mill for thirteen years, and subsequently in other mills in Dover and Exeter. At the age of 36, in 1853 he determined to start his own mill on the Lamprey River, in partnership with Isaac Flagg, Jr. (Biog. Review 1897: 414). Wiswall was an active member of the Congregational Church of Newmarket, serving as Deacon for more than fifteen years. In 1872 and 1873 he represented Durham in the state legislature.

The credit records of R.B. Dun & Company record the growing strength of the company, from the first lease of the mill in 1857. In April of that year, Dun's agent reported that Wiswall and Howard Moses were

both men of good standing and character: also men of enterprise. 'W' is about 40, married, has a family. 'Moses' about 26 and married; has a family also; the latter is in feeble health, but good business qualifications, and manages the business affairs of the firm. They own no real estate, and own no property outside that invested in their business. Their credit is good here. They have most of their bills discounted at the Newmarket Bank; they are doing a profitable business...

Three months later, the agent reported that they had bought the mills and privilege, though they still had little property outside of the business. Moses' health was still failing, and he was not expected to live long. His death was reported the following year, his interest having been transferred to his father, Charles C.P. Moses. C.C.P. Moses was the firm's junior partner until his death in 1883, a few weeks before the fire which destroyed the mill.

Wiswall's purchase of the mills was not without hardship. The financial panic which affected many businesses beginning in August 1857 also struck Wiswall. The failure of a Boston firm with whom the paper manufacturer had been dealing "embarrassed them to such an extent that they were obliged to mortgage everything," the credit agent reported. "They are now running night and day and working off their Embarrassment.": Wiswall soon paid off his debts, and from 1859 until the mill burned in 1883, the credit reports are unceasing in their admiration. 2/28/1859: "Wiswall one of the best of manufacturers. Honorable and Honest. Old bills mostly settled or in process of settling." 12/7/1860: "A first rate businessman, scrupulous, honest, and punctual. Doing a capital business and no man's credit and standing are better than his."

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Wiswall's success was an anomaly in Durham by 1860. The opening of the Boston & Maine in 1841 through the town, bypassing the village, had discouraged industrial investment in the town. As employment outside of Durham became more attractive, population fell. After its peak in 1830, the town lost population in every subsequent census year until 1930. By 1860, Durham's rank among the towns of Strafford County had fallen to ninth from its fifth place rank thirty years before. Increasingly, Durham's economy was agricultural. In the 1860 Federal industrial census, the contrast between Wiswall's Mills and activity in the rest of the town is starkly portrayed. Wiswall's paper mill, much the largest manufacturing industry in Durham, was reported capitalized at \$25,000, a figure that amounted to 60 percent of the entire capitalized value of industrial concerns in the town. Seven men and one woman were employed, and the wallpaper produced annually was valued at \$30,000, about 50 percent of the total reported value of the town's manufactured products. Both the saw and grist mills were still in operation. Wiswall's sawmill, was the larger of two then operating in Durham, as was his grist mill.

Wiswall continued to operate the grist and saw mills for a few years, but as the water power available was insufficient to operate all three mills at once, particularly during the dry summer months, the firm gave less and less attention to them, allowing the machinery to deteriorate without replacement as needed (Griffiths). By 1870, the grist mill appears to have ceased operation, and the sawmill, equipped with one up-and-down saw and three small circulars, was operated only three months of the year. By contrast, Wiswall expanded the operations of the paper mill. In 1868, Wiswall constructed a new dam, "houses were erected for the workmen, and a store was kept by Austin Doeg" (Stackpole 1973: 308-9). The paper mill was expanded adding ten feet to its length, and an ell 15x30 feet in size. Bleach and stock houses were also constructed, 30x30 and 30x50 feet respectively. Two turbines powered the paper mill machinery: they were described as Sanborn and Russell wheels, with horsepower ratings of 20 and 50 respectively (U.S. Census: 1880). The mill was equipped with five washers (340 lb capacity), 2 beaters (350 lb capacity), and one 48-inch cylinder machine. In 1870 the Federal manufacturing census reported that T.H. Wiswall & Co. manufactured 309 tons of wallpaper valued at \$69,365, or 53 percent of the total value of products manufactured in Durham. Seven men and five women were employed. The R.G. Dun credit bureau reported in 1872 that "T.H. Wiswall & Co. are money making men doing a large and profitable business." "This was the busiest spot in the whole town," Sadie Griffiths remembered.

The mill's relationship to other mills in the state at this time is best portrayed in the directories of the paper trade, published by Howard Lockwood of New York, still one of the industry's leading publishers. In 1878, T.H. Wiswall & Co. was one of 34 operating paper manufacturing companies reported in New Hampshire. Wiswall's, known as the "Pawtuckaway Mill," was one of only two mills in the state producing "hanging" paper (wallpaper), the other being a smaller mill in West Claremont. Its reported daily product, 2500 pounds per 24 hours, was about average for the paper mills reported. The directory does report one other mill in Durham, at Packer's Falls, run by W.W. Page & John N. Coffin, producing book paper and newsprint. Evidence for this mill is absent from the 1870 and 1880 census returns, and it is doubtful that it lasted very long. It is not reported in the 1883 paper trade directory. Wiswall's Pawtuckaway Mill was again reported in the 1883 directory with no change in the information presented over the 1878 data.

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On November 1st, 1883, fire entirely destroyed the mills of T.H. Wiswall & Company. According to the Dover Enquirer, which reported the calamity on November 8th,

the fire caught from a match among the dry stock and quickly communicated to all parts of the buildings. ... Mr. Wiswall at the time of writing places his loss at \$25,000 with an insurance of \$14,000. This is a great calamity to this town, as the firm lost its junior partner, Mr. C.C.P. Moses, only a few weeks ago, and Mr. Wiswall at this time of life will not feel like commencing business anew, as he must, if he attempts to rebuild. Eight men and five women were employed about the mills, besides much outside help.

Wiswall was 66 years old in 1883. With his partner of 26 years just dead, and insurance only a fraction of the value of the mill, Wiswall confirmed the prediction of the Enquirer. The property was put up for sale the following month. In addition to the mill site, the property included six tenement houses, one "elegant private residence, and about thirty acres of land (advertisement, quoted in Bolian & Maymon: 1985). There is no indication, however, that any purchasers were found, and Stackpole reported that the sawmill was still in operation in the spring of 1896, when a freshet washed out a portion of the dam.

In 1899, the property was purchased by James W. Burnham (1854-?), formerly a lumber dealer and livery business operator in Durham. Burnham organized the Newmarket Electric Light, Heat & Power Company and constructed a small hydroelectric station at the foot of the canal where Wiswall's paper mill had stood. The first power was generated for electric light on February 20, 1900, supplying the houses of Burnham, Mrs. Sarah Woodman (the Highland House), and the Griffiths brothers. In 1912, the property and operation was sold to the Newmarket Electric Light Company, which constructed a new concrete dam and the present headgates across the canal (Stackpole 1973: 309). The company was later acquired by the New Hampshire Electric Company. It is unclear how long power was generated at the site, though its operation would probably have been unprofitable after the construction of much larger hydro facilities like that at Comerford (1930). Despite its condition, New Hampshire Electric retained the site until 1955, when the land was sold. Very little structural remains have been recovered from the site for this period. In addition, the use of the site for hydroelectric generation relates to a theme that has not yet been evaluated on a statewide basis. Consequently, this period of use is not included in the site's period of significance.

The site's designated period of significance, 1835-1896, reflects the operation of the water-powered mills. Rural mill sites, without the benefit of fire insurance surveys or other detailed plans, are notoriously difficult to interpret in the absence of documentary evidence which might inform us about the equipment, construction, and operation of the mills. The research potential for the Wiswall Falls Mill Site lies both in its integrity and in the data it provides on an unusual site arrangement. Although surviving mill sites dot the rural New England landscape, the close association of three water-powered mills is less frequently encountered, and excavation of the site may provide insight into their joint operation. Although much of the power supply for

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WISWALL FALLS MILL SITE

the paper mill is visible in structure 1, nothing is known about the supply of the saw and grist power system. Archeological investigations of structures 3 and 7 have thus far indicated that "the site/complex has the potential to yield information on the local history and economy in the form of structural detail, machinery, and rare biodegradable artifacts from within the very moist lower strata..." (Bolian and Maymon 1986). The Wiswall Falls Mill Site provides an excellent opportunity to examine in detail one of the major features of Durham's 19th-century economy.

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WISWALL FALLS MILL SITE

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Continuation Sheet

Section number 10 Page 1 of 1

WISWALL FALLS MILL SITE

10. VERBAL BOUNDARY DESCRIPTION

The nominated property consists of two parts. The larger part is that portion of the property conveyed by Carl F. Spang, Jr. to the Town of Durham on December 13, 1965, which lies on the east side of the Lamprey River. This parcel is described as follows:

Commencing at the northeast corner, on the southerly side of Wiswall Road in the Town of Durham at a concrete bound set in the ground, which is 257 feet easterly from the east bank of the Lamprey River and is on the easterly side of a roadway leading southerly from Wiswall Road; thence south 4° 6' west 383.5 feet to a stake and stones in the northerly line of a 135-foot transmission line right of way owned by Public Service Company of New Hampshire; thence south 71° 12' west 164.2 feet to the top of the bank of the Lamprey River; thence upstream by the bank of the Lamprey River to the southerly side of Wiswall Road; thence 257 feet easterly along Wiswall Road to the place of beginning. Approximately 2.5 acres.

The second part of the nominated property consists of an adjoining 50-foot wide strip of land, part of a lot presently owned by Carl F. Spang, Jr. which abuts the eastern boundary of the property described above. This strip is 383.5 feet in length, extending from Wiswall Road along the eastern boundary of the town land above described. Approximately 4 tenths of an acre.

9. Major Bibliographical References

Previous documentation on file (NPS):

- ☐ preliminary determination of individual listing (36 CFR 67) has been requested
- ☐ previously listed in the National Register
- ☐ previously determined eligible by the National Register
- ☐ designated a National Historic Landmark
- ☐ recorded by Historic American Buildings Survey # _____
- ☐ recorded by Historic American Engineering Record # _____

☒ See continuation sheet

Primary location of additional data:

- ☒ State historic preservation office
- ☐ Other State agency
- ☐ Federal agency
- ☐ Local government
- ☐ University
- ☐ Other

Specify repository: _____

10. Geographical Data

Acreage of property 3 acres

UTM References

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Zone Easting Northing

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Zone Easting Northing

D

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☐ See continuation sheet

Verbal Boundary Description

☒ See continuation sheet

Boundary Justification

The major portion of the nominated property as described above is the 2.5-acre parcel owned by the Town of Durham on the east side of Wiswall Falls. This portion includes seven of the nine structures uncovered during the archaeological investigations of the site in 1985 and 1986. The property boundaries were expanded fifty feet to the east in order to include structures 8 and 9.

☐ See continuation sheet

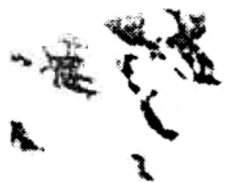
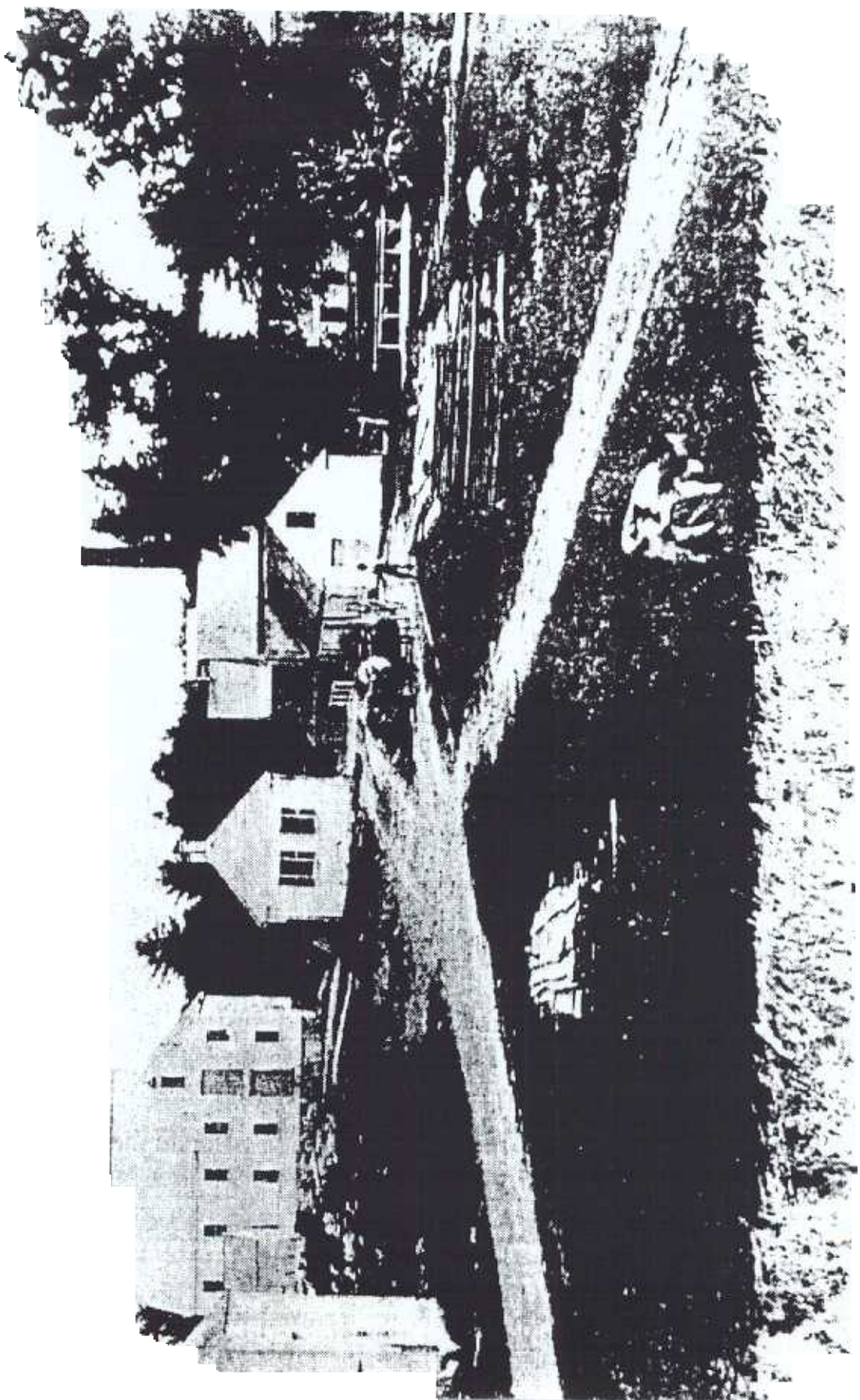
11. Form Prepared By

name/title Peter H. Stott

organization P.H. STOTT CONSULTING SERVICES date October 15, 1987

street & number P.O. Box 356 telephone (617) 332-5548

city or town Newton Highlands state Mass. zip code 02161

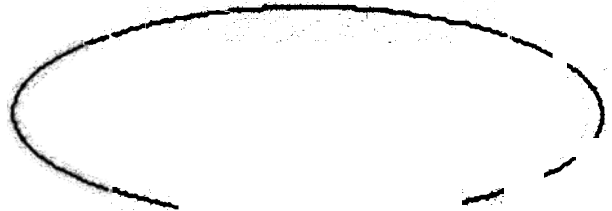






LAMPREY RIVER WATERSHED ASSOCIATION

LRWA Newsletter Winter 1986
%Dick Lord, Bennett Rd., Durham, N.H. 03824
Phone: 659-2721



LRWA NEWSLETTER

This is the first issue of the LRWA quarterly newsletter. It is to inform members and friends of LRWA activities plus sharing topics of interest to those concerned with river conservation.

There is an oval at the top corner of this page that needs to be filled with an appropriate logo for the LRWA. The members at the March meeting will vote on the most appropriate logo sent to our address by Monday March 10. There is no prize besides the honor of seeing your logo every three months at the top of the newsletter.

We would like the LRWA to represent and respond to the concerns of people throughout the watershed - but we need to hear your ideas and needs. Come to our meetings, or contact Lou Ensor or Dick Lord at 659-2721 or Judith Spang at 659-5936.

There will be a special meeting on April 8 about CANOE TRIPS ON THE LAMPREY RIVER - SAFETY, FAMILY OUTINGS AND MAPS to help gear up for spring canoeing or summer family trips. There will be a published guide to the river plus maps for sale at the meeting.

SALMON UNLTD. TO HELP CLEAN-UP

Salmon Unlimited has proposed to join with LRWA in the 2nd Annual Lamprey River Clean-Up, scheduled for May 3rd, and with sufficient interest, May 4th. Last year, a flotilla of canoes swept the shores of the Lamprey from Bennett Road in Durham to Route 108 in Newmarket, capping a day of "clean-up and camaraderie" with a picnic at Bob Mongeon's.

This spring, with the help of Salmon Unlimited, more shoreline can be covered. We are also looking forward to this event as an opportunity to get better acquainted with a group which shares so many of the LRWA's goals.

MEETINGS: Second Tuesday of each month at 7:30 in the Durham Town Hall

FEBRUARY 15: a Citizens' Workshop on New Hampshire Rivers, Concord

APRIL 8: Lecture of CANOE TRIPS ON THE LAMPREY RIVER, Durham Town Hall

MAY 3 & 4: LRWA and Salmon Unlimited river cleanup

We are hoping for a record turn out. Needed are people to man canoes, larger motor boats to transport bags as they accumulate, trucks for pick-ups at mid and end points, and even just picknickers to add to the fun.

Put the dates on your calendar and call Judith Spang at 659-5936 for more information.

FALL ACTIVITIES OF THE LRWA

On September 8th, Evelyn Swimmer, a natural resource planner with the National Park Service, discussed future management and protection possibilities for the Lamprey River in a public presentation sponsored by the LRWA. She led the audience through steps necessary for developing a river program: fact-finding to determine concerns of people involved with the river, developing goals and setting timetables for achieving them. She stressed the need to involve people from outside the watershed association, both "friend" and "foe", to develop a balanced program. The Parks Service has been of tremendous help to fledgling watershed groups, and the LRWA is hoping to take advantage of their offer of assistance to us.

Ms. Swimmer's presentation stimulated the LRWA's Board to adopt some new approaches. First, a survey of riverfront owners, public officials and others concerned with the river is being considered as a tool for focussing LRWA

goals and priorities. The Questionnaire would seek to find out what aspects of the river people consider to be the most valuable,- problems, attitudes toward river protection measures, etc. An inventory of uses along the river would also result.

In addition to helping the LRWA, the survey would also serve as a source of information for decision-makers in watershed towns. However, the success of the effort depends on the cooperation and assistance of people from each town - listing waterfront property owners, for example. Volunteers gladly accepted!

This fall, the LRWA has also undertaken a new initiative to gain greater participation by conservation commissioners in watershed towns. A letter was sent to each commission, with a request for a designated representative to the LRWA. Since problems arising in one part of the watershed affect everyone downstream, the LRWA has made increased cooperation a priority for this year. We also want to lend our collective support to any individuals or towns who want to undertake programs to protect the river.

Finally, this fall, various members of the LRWA have been speaking to area civic groups and to groups of public officials, including the Durham Historical Society, Raymond Conservation Commission, and the League of Conservation Voters. In addition, John Hatch, Erick Sawtelle and Dick Lord were all interviewed by the media concerning the proposed hydro development at Macallen Dam (see article).

The LRWA was well represented at a recent hearing concerning the expansion of the Coastal Zone Management program to Great Bay, and three members are scheduled to attend the upcoming Citizens' Workshop on New Hampshire Rivers in Concord. Water quality monitoring has been suspended until ice-out.

It has been a significant time period for the organization in terms of defining and expanding goals and setting some new directions. New members or people wishing to participate in reaching our goals are always welcome.

WATER QUALITY MONITORING HANDBOOK NEARS COMPLETION

April is the target date for publication of what may be one of LRWA's most significant achievements of the year - the production of the "Handbook for the Monitoring of Water Quality in Rivers: A Guide for the Lay Person". The 70-page guide is designed to undertake monitoring of rivers.

Project Administrator, Judith Spang, comments: "From the enthusiastic feedback we've gotten on the draft Handbook, it is clear that there is a real need for an easily understood layperson's manual on water quality. Watershed groups from Merrimack to New York State are already ordering copies, and the scientists reviewing it have been just as positive".

The Handbook takes a soup-to-nuts approach - from organizing a monitoring group; through the basics of river hydrology, chemistry and biology; to instruction on how to perform specific water quality tests - all in terms easily understood by the lay person. Technical information was provided by UNH's Freshwater Biology Group, and several LRWA members contributed countless hours of time in reviewing and revising succeeding drafts in what promises to be a most valuable tool for watershed groups throughout the northeast.

If we do not care for the life of the river,
there will be no life for others to share.

F.E.R.C. LETTER ABOUT MACALLEN DAM

The following letter was sent by the president of LRWA, Richard Lord, to The Federal Energy Regulatory Commission. The letter speaks for itself.

27 November, 1985

Dear Sirs:

The Lamprey River Watershed Association requests that the following statements be recorded in protest of the above application for the development of Macallen dam as a hydropower facility.

1. EFFECT OF RAISING WATER LEVEL ON LAND USAGE.

The applicant proposes to increase the height of the existing dam by two feet. Since no provision will be made to increase the capacity of the flood gates, this will not only increase the mean stream height, but also the flood plain. The additional water height will submerge part of Moat Island in the conservation trust property of the town of Durham known as the Doe Farm. It will also increase the erosion of a fragile structure of undercut banks in many places along the Lamprey River shoreline.

2. DETRIMENTAL EFFECT ON ANADRAMOUS FISH PROGRAM.

Changes in flow at the Macallen fish ladder, changes in upstream habitat and the possibility of smaller fish being captured in the intake system are all detrimental to the very extensive and succesful anadramous fish program that has been established in the Lamprey River by the New Hampshire Fish and Game Department.

On the 17th of April, 1985, the House, Senate and General Court of the State of New Hampshire adopted a resolution opposing hydropower development of the Lamprey and Cocheco rivers. This resolution stated that "The Lamprey River is recognized as the state's most significant river for all anadramous species".

The success of the Lamprey River anadramous fish program and its significant contribution to recreation and economic well-being of the seacoast region and the state of New Hampshire will be endangered if this application is granted. The proposed application would cause an undesirable negative impact on the enviornment of the Lamprey River and does not represent the best usage of a significant composite river resource. The economic viability of this hydropower project is questionable and is based on ill-conceived state and federal financial incentives that clearly benefit the developer without providing any benefits to either the power consumer or the enviornment.

Sincerely Yours,
Richard H. Lord, President

MEMBERSHIP

For those who would like to become a member and support the LRWA efforts:

NAME _____ STREET _____

TOWN _____ ZIP _____ PHONE _____

MEMBERSHIP CATEGORY (tax deductible)

Family . . .	\$15	Senior Citizen	\$5	Patron	\$100
Individual	\$10	Organization	\$25	Angel	\$500
Student . . .	\$5	Sponsor	\$50		

WORKSHOP ON RIVERS TO BE HELD IN CONCORD

On Saturday, February 15, there will be a Citizens' Workshop on New Hampshire Rivers held at the Conservation Center of the Society for the Protection of NH Forests in Concord. Representatives of LRWA will attend the conference which includes group sessions on river policy, bills to be presented to the legislature and building a public awareness campaign.

The Lamprey River is one of the cleanest rivers in southern New Hampshire. The statewide conference will help all of us in our efforts to keep our river safe from pollution, protect its banks from degradation by poorly planned development and enhance the river resource by encouraging appropriate recreational activities.

The conference will give participants the opportunity to provide input on legislation relating to rivers. It will also serve to build support for the legislation, as participants will be encouraged to participate in a statewide public awareness effort. We should have information on legislative issues that we will need to support. We will try to keep you posted as to the best way to keep our river healthy for our use as well as for our grandchildren.

WANT ADS

This column is for the use of the LRWA members, to swap, sell or buy items concerning the use of the river (fishing equipment, boats, life jackets, etc.). To include your want ad in the next issue of the LRWA newsletter, please send your ad to the LRWA address before June 1.

WANTED: Paddle boat and children's life vest (age 7-10). Call Lou Ensor or Dick Lord at 659-2721.

LAMPREY RIVER WATERSHED ASSOCIATION

% Dick Lord
Bennett Road
Durham, N.H. 03824

The Wadleigh Falls Site:

An Early Holocene site in Southeastern New Hampshire

Charles E.

University of New Hampshire

With Faunal Report by

Arthur E. Spiess

(Maine Historic Preservation Commission)

Abstract

Archaeological investigations at the Wadleigh Falls site (NH39-1) have revealed deeply buried occupations dating to the early Holocene. Testing of the site in both 1980 and 1982 revealed the presence of extensive occupations during the Middle Archaic as well as strong indications of Early Archaic activity. Recovered lithic materials suggest that bifacial tool manufacture was a major activity at the site during Middle Archaic times. Unlike many early interior prehistoric sites in the Northeast, sizable quantities of calcined bone were recovered. Analysis of the faunal remains from the site supports the notion of a broad based subsistence strategy for this time period. An emphasis on reptiles at the site does, however, indicate that there are differences between sites. The absence of later intrusive material provides an excellent context for the study of assemblages and subsistence.

Introduction

Archaeological survey and testing by the Coastal Zone Survey in 1980 confirmed evidence from a collection of a Middle Archaic occupation on the island immediately below Wadleigh Falls. On the island, which is approximately 180 meters long by 110 meters wide, the

ts on deposit ered on material in re appeared to eas result of secondary dep m e sion the upper terrace A fieldschool sponsored by the U ersit Hampshire under the direction of R. Ewing and the ju or author, set ou more clear define site boundaries, stratigraphy, and spatial patterns at the site. Four 2m X 2m units and one 1m X 3m unit were excavated on the upper terrace encountering culturally stained soils with thic and faunal material over an area of approximately 525 square meters In addition to the arge quantities of thic debitage (exceeding 48 and stone t s (260 elat rely arge quantities of calcined bone and several charred nut fragments were recovered from the 1/8" screens used Recent analysis suggests a component at the site as the we defined Middle Archaic comp

Environmental Setting

The Wadleigh Falls site is located in Lee, NH, on Wadleigh Falls Island, immediately below the upper falls of the Lamprey River. (Figure 1) It is on the western edge of the coastal plain, in close proximity to a variety of ecological zones. The estuarine resources of Great Bay are currently less than 5 miles and the Atlantic coast is approximately 8 miles to the East. The interior uplands are directly to the West.

At the terminus of the most recent glacial cycle, circa 12,000 BP, this area of New Hampshire was covered by a transgressive sea which deposited a glaciomarine clay.(Goldthwait, et.al.,1951:42) With the subsequent uplift, due to isostatic rebound,

this clay was locally eroded down to bedrock by the present drainage system. The river flowed over the present location of the island until it had down cut the upriver bedrock enough to divert it. The steeply dipping bed plane of the bedrock, oriented to the Northeast, caused the river to be shifted northward, opening a flat, well drained area

deposited sand upon the sea level site near
occupation

beds and was buried below more than a meter of alluvium

Test excavations at the Wadleigh Falls site have yielded artifactual material typologically of Middle Archaic and possibly Early Archaic age. Although the majority of cultural material is contained in a single stratigraphic unit, between 110 and 170 cm below the surface, the vertical distribution of that material suggests that an earlier cultural level can be partially differentiated below the Middle Archaic level.

Radiocarbon dated wood charcoal from the upper part of the 60 cm thick cultural horizon returned dates of 6,530 \pm 80 (Beta-9494) and 7,920 \pm 100 (Beta-9495), while 7,920 \pm 150 (Beta-9496) dated for the lowest levels

Natural and Cultural Stratigraphy

The soil profile at Wadleigh Falls exhibits no abrupt changes in layers that might indicate individual depositional episodes. The visible boundaries between strata are diffuse. This may be a product of soil movement. Five Strata were defined in the excavations. The 0+AB horizon is a thin organic layer approximately 7 cm thick, no plowzone exists at the site. The second stratum ("C") is composed of yellowish brown (10YR 7/8) medium to fine sand and extends to approximately 110 cm below the surface (B.S.). Some lensing is evident within this stratum. The third ("D") is a band of dark yellowish brown (10YR 3/3) fine sand, between 110 and 170 cm B.S.. This stratum varies from 45 to 60 cm thick across the site with darker and lighter areas visible, however

there is no clear lensing. Next is a stratum of fine yellowish brown (10YR 4/6) silty sand ("E"), which changes to a light olive brown (2.5Y 5/4) sandy silt ("F") at about 230 cm B.S.. The profile ends in a cobble layer at approximately 250 cm B.S.. Very few stones of any size are found in any of the upper strata (A-E).

Idland

Late

early Holocene late es of mate ecovered from
the excavated level stated above there no clear
 neation of the two components ertical distribution of raw materials and tool
types is the basis for this d

Clarification of e cu horizons may not be possible due to post-depositional
movement of the cultur debris Recent publications on this issue (i.e. Wood and
Johnson, 1977; Schiffer 1984; and more) suggest that true
occupational zones m tes

Seldom are attempt orma corporate them into
 stages nvestigations" Schiffer 1983:695. One
examination of formation processes can be found in Thomas and Robinson's 1980 report
the John's Bridge site n Swanton, Vermont In their model of soil development and site
formation s suggested that material deposited upon the surface will become
incorporated into the soi profile relatively quickly. The combined effects of gravity
and the mechanical activities of worms, small rodents, insects, wind, rain and frost are
seen as resulting in the observed 40 cm vertical spread of material from this single
component Early Archaic site. While occupational zones may not exist in their original
state, vertical patterning should frequently exist, however a "...pattern of overlapping
frequency curves, with slightly separated peaks...should be a characteristic pattern for
multicomponent sites on non-depositional soils."(Thomas and Robinson, 1980:30)

The soils at Wadleigh Falls are clearly depositional. However, the frequency of flooding in the Early and Middle Holocene is not known. The site may have lain exposed for hundreds of years. The vertical distribution of cultural material upon the site suggests that it has undergone extensive soil movement. To illustrate this movement and

med

was examined. The vertical distribution of cultural material

exhibits a similarity to that found by Thomas at

John's Bridge site (1983). Vertical drift on the order of 25cm above and 20cm below the peak frequency is suggested. The 453 flakes from one meter square in this concentration were divided into size classes at 1/8 inch intervals, then plotted by level as a test for vertical size sorting. No strong sorting is indicated, however smaller pieces of debitage tended to move greater distances vertically.

It should be noted that other well stratified Early Holocene sites in the Northeast have artifacts concentrated in thin relative to thin deposits. (e.g. the Johnson No.3 site Funk and Wellman 1984) and a bifurcated point workshop at Highgate Falls, Vermont (Thomas, personal communication)). One can only speculate at present why these

differences exist. One factor might be the amount of time the site is exposed at the surface or near the surface. Rapid burial would help preserve the deposit. The relative amount of organic material may also have some bearing on this problem. The organic staining and relative abundance of calcined bone argues for a rich organic midden at Wadleigh Falls. This organic material may have encouraged animal burrowing (i.e. worms, insects, and small mammals) and root growth within and surrounding the cultural zone, accelerating the rate of lithic dispersal at the site.

The vertical drift of material makes definition of specific cultural horizons and their assemblages difficult. In an attempt to deal with this problem, the distribution of raw materials and point provenienced artifacts was plotted. Patterns observed strongly suggest that the site is multicomponent. (see Figure 2)

Several factors lead us to believe that multiple occupations exist. The distribution of both tool types and raw materials show that strong differences exist between the upper and lower levels of the cultural horizon. The upper part contains a variety of lithic materials, predominately rhyolites and felsites. A wide range of tool types are also scrapers, graters and other tools. The lower part is significantly different. Polyhedral quartz cores, quartz scrapers, choppers and quartz debitage dominate the assemblage. A single untyped point was also recovered from the lower levels.

Cultural Assemblages

While there is mixing of the two recognized components at the site, they may be separated clearly enough to tentatively characterize each assemblage. To achieve this separation, each triangulated artifact within each unit was plotted. The pattern of the upper and lower components can be recognized in nearly all units. A small break in the vertical distribution of the predominately quartz lower component separated by 5 to 10 cm from the predominately upper component was recognized in nearly all units. In this manner each artifact could be assigned to a component based on its relative stratigraphic position. In cases where there was a question, artifacts were assigned to the larger upper component. (see Table 1)

THE UPPER COMPONENT

Approximately 85% of the lithic material can be attributed to the upper component of the site. These materials are typologically very similar to the Neville complex at the Neville site, radiocarbon dated between 7000 and 8,000 BP. The characteristics of this assemblage are "Neville and Neville variant points, perhaps also Stark points; unhafted scrapers of steep bitted, beaked, or casual form; and tiny quartz crystal scrapers." (Dincauze, 1976:120) Simple shaft and Neville based perforators, heavy flaked choppers,

and tabular whetstones were also identified at Neville. These characteristic forms of the Neville complex are found in the assemblage from the upper component at the Wadleigh Falls site. (plate 1) There are however, two tool types within the assemblage which were found in later contexts at the Neville site. One of these a full-grooved axe, is attributed to

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d at dleigh d at he top
and may suggest a Late Archaic occupation. However Starbuck (1983) attributes them to the Middle Archaic component at NH31- a site in Belmont, NH.

Preliminary analysis of biface fragments from this component suggests that manufacture of bifacial tools was an important activity during the Middle Archaic occupation of the site. Fragments representative of all but the earliest stages of manufacture have been identified. Large rhyolite quarry blanks appear to have been brought to the site, where they were flaked into a number of bifacial tool types, primarily New England type projectile points. Over 60% (n=12) of the projectile points exhibited signs of wear. Shoulder probably due to abrasion while lifted, was most common (n=11). This phenomenon may also be due to soil movement, however this is not likely as few flakes exhibit this localized abrasion. 55% of all points (n=10) were broken, 70% across the blade. Two perforators exhibit extensive tip wear suggesting use in a rotary motion functioning as a reaming tool. The extensive wear on a number of bifacial tools supports the notion that at least some of the tool manufacture at the site was for replacement.

A radiocarbon date from within these levels, between 124.5 and 133 cm below the surface, has been obtained. The date, 6,530 \pm 80 (Beta-9494), is significantly later than those for the Neville complex at the Neville site. It is possible that this date is contaminated since it was comprised of a number of pieces of charcoal which were found scattered throughout the level. A feature originating within these levels between 125 and

145 cm below the surface, was dated at 7920+/-100 (Beta-9495). This date was from a few large pieces of wood charcoal. It is believed that this date (7920+/-100) dates the majority of the cultural material, however, a more ephemeral later Middle Archaic, and/or Late Archaic occupation may exist.

LOWER COMPONENT

The lower component of the site contains the artifactual material from this component, nearly 70% M. Quartz is similar to material from the Early Archaic "B" horizon at the Wells Beach site in the "Lakes Region" of Hampshire, dated to 8,985+/-210 (GX-4571) and 9,155+/-395 (GX-5445). Chunky quartz scrapers and exhausted polyhedral quartz cores comprise half the assemblage at Wadleigh Falls. A quartz spokeshave, several retouched and utilized flakes, a perforator made on a biface fragment, an abrader, and 3 hammerstones were also recovered from these levels. Four biface fragments (possibly intrusive) and 3 graters complete the inventory. One grater is made of Red "Saugus" Jasper. Manufactured on a biface thinning flake, the grater is the only one on the site.

A point was recovered at these depths (plate 2). Its vertical position, relative to other artifacts within its excavation unit, can be seen in figure 1. This point exhibits general similarities, in the form of sharp tapered shoulders and a broad stem, to Early Archaic types such as Kirk Stemmed and Kanawha Stemmed. Unfortunately the base of this point is broken and therefore it will remain untyped.

A radiocarbon date, of a single chunk of wood charcoal, from within this lower zone yielded the date 8,630+/-150 (Beta-9050). The sample was in clear association with the above described point.

Features

Very few soil features were recognized in the field other than rodent disturbances, probably due to the forementioned soil movement. A number of features were distinguished during the 1980 excavations (Skins, 1980). Subsequent analysis, however, indicates that most were rodent burrows. Only two recognized features appear to be cultural.

date

The feature is bowl

bottom. ed a quartz gravel, an abrader, and several
cined bone fragments. Large quantities of charcoal were also recovered from
No soil samples were retained for flotation. Interpretation of this feature
, as its contents are similar to those of the levels at which it originates. The
stained soil and quantity of charcoal are all that distinguish this feature from the soil
surrounding. Both charred nut and calcined bone are found in varying densities
throughout the cultural levels. Both the size and shape of this feature argue against
being a remnant rodent burrow. The charred nut fragments have been identified as either
butternut (M. Pinney, personal communication). Their cultural
association is only tentative at present due to the lack of adequate off site sampling.

Another feature, a concentration of rocks (possibly fire-cracked) lies at the top of
the upper component at 15-120 cm below the surface. No charcoal or artifactual material
was found in association with this feature. Its stratigraphic position suggests
the presence of a later component, a hypothesis yet to be substantiated although suggested
by the presence of expanded bit scrapers.

Discussion

In the last 5 to 10 years, several Early and Middle Archaic sites have been excavated
and 2 regional surveys of sites and collections from this period have been undertaken.

35% of the flaked stone tool assemblage is biface fragments. However compared to Neville where less than a third are biface fragments, this is a sizable quantity. The ratio of finished points to biface fragments illustrates this trend more clearly. At NH31-20-5, the ratio of points to biface fragments is 1:5.6, Wadleigh Falls 1:3.7, and Neville about

fa acture is more prevalent
Wadleigh Falls than e, does not approach the emphasis found at
NH31-20-5 The fauna assemblage from Wadleigh F supports this ew of a re
generalized economy. Nonspecialization seems to be the norm for the Middle Archaic in the
Northeast However differences between sites can be recognized. Clearly both lithic and
faunal assemblages are variable between sites during the Middle Archaic and possibly the
Early Archaic

Dincauze and Mulholland (1977) propose a model for Early and Middle Archaic
settlement patterns in ch population movement northward was seen as being essentially
imited to the oak-forest one. The northern boundary, defined by the 20% oak isopol
"passed the present Massachusetts-Connecticut border before 9,000 BP...(and) it had
reached southeastern New Hampshire and extended up the Maine coast by 8,000 BP" (1977:
450 low population densities were expected north of this line They note that this
boundary may not have been in effect seasonally or with special adaptations.

The site distribution in general, based on collections, survey, and excavations
appears to support this model. However, the importance of lakes and rivers to transcending
this boundary is underemphasized. A survey of Early and Middle Archaic sites in Western
Maine found a strong tendency for sites to be located at lake inlets, outlets and
thoroughfares (Spiess, et.al., 1983). Furthermore our knowledge of faunal assemblages
(although limited) suggests an orientation toward aquatic species. Frequently fish (often
anadromous), aquatic reptiles, and water oriented mammals (ie. beaver, muskrat) and
occasionally aquatic birds are encountered in assemblages. It appears, given the evidence

from western Maine, that aquatic resource abundance had a greater influence on site selection than the limits of the reconstructed oak-forest ecotone.(1983)

Conclusion

• Known about the Early and Middle Archaic

While Joe 1964 and others had

time, a hiatus was perceived in the Northeast. Since that time, traces of the Early and Middle Archaic have been identified throughout the Northeast. It now appears that a sequence similar to that for the Southeast from Paleoindian to Middle Archaic can be identified. Points similar to Hardaway side-notched, Palmer, Kirk corner-notched, Kirk stemmed, Charlestown corner-notched, several bifurcate styles, Stanley (Neville and Morrow Mountain (Stark) have been recovered from several sites in the Northeast (Funk and Wellman, 1984; Dincauze and Mulholland 1977; Spiess, Bourque and Gramley, 1983; and G. Nicholas, personal communications). Northeastern variants on this sequence such as the Merrimack (Dincauze, 1971, 1976) New England Variant or Amoskeag (Dincauze, 1976; Foster, et.al., 1981) and the John's Bridge (Thomas and Robinson, 1980) points are evident. The discovery, excavation and analysis of new Early and Middle Archaic sites and two regional surveys have given us glimpses of the complexity of the subsistence strategies, settlement patterns, and interaction spheres of the Early and Middle Archaic hunters and gathers in the Northeast.

Appendix

Middle Archaic Subsistence:

Faunal Remains from NH39-1

Ham

b; Arthur E. Spiess

Maine Historic Preservation Commission)

The Faunal Assemblage

All of the faunal material from the site appears to have been "calcined", fired to a high temperature and chemically altered (e.g., Shipman et.al., 1984). All the bone was white and chalky to the touch. It consists of uniformly very small fragments which often preserve the fissuring or block fracture characteristic of calcined bone.

All bone was recovered by screening on 1/8 inch hardware cloth, and the largest bone fragment (actually 3 pieces that fit together) weighed 3.83 grams. The total sample consisted of 5,643 fragments totalling 203.70 grams; thus, mean fragment weight was 0.036 grams. Usually pieces had a maximum dimension under 5 mm. Of these 5,643 fragments, Spiess selected about 150 (2.5%) as candidates for identification below the level of class.

INITIAL SORT

The faunal analysis began by inspecting each "lot" of bone (subdivided by square, level, and quadrant). The original 5,643 fragments were divided into three categories (unidentifiable, turtle shell, and identifiable), and all identifiable fragments removed for a later re-examination.

Unidentifiable ("unid") fragments are defined as possibly mammal and/or bird and/or turtle bone that cannot be identified below the class level. Turtle shell("TS") fragments are those scraps of bone identifiable by their structure or morphology as turtle carapace or plastron, but not further identifiable. Identifiable ("ID") bone is

mamm

just to place doubt that the shad range number of the carapace fragments as at the here non-descript to exhibit the distinctive morphology of the surface of turtle carapace are, therefore, not included in the count

[[INSERT TABLE 2 HERE]]

IDENTIFIED BONE SAMPLE

Table 2 presents the results of the work with the identifiable bone sample, the sites for the table are presented below.

Shad (Alosa sapidissima)

Eight vertebrae have been identified to this species, and no fishbone has been identified to any other species (or has gone unidentified as far as we can tell). Four vertebrae are first or second post-occipital (cervical) vertebrae, from a minimum of three individuals. All of the vertebrae are precaudal. The high representation of first or second cervical vertebrae in the sample can be explained by their structure, which is more compact antero-posteriorly (and hence more solid and resistant to mechanical damage) than thoracic or caudal vertebrae.

2. Shad: Size and Seasonality

Vertebral diameters range from 0.30 cm. to 0.47 cm. corresponding to live weight of roughly 0.15 to 0.25 kg. and lengths of 10-12 inches judging by a comparative specimen in Maine State Museum possession.

Two of the vertebrae preserve "readable" periodic (assumed annual) layers on their articular surfaces. One exhibited two annuli on a vertebra of 0.30 cm. diameter. The last layer forming appeared to be a growth layer of less than 1/4 thickness relative to previous growth layers, with the caveat that marginal erosion did not appear to have

meter and

appeared to be , but w

ial an in may have removed the outermost layer on this

Unfortunately have no shaded specimens of known season of capture for comparison of annual growth state. However, by analogy with other fish (dangerous practice), these specimens were a late winter or spring capture. This tenuous information fits with the known anadromous habit of the species and the inland location of the site.

3 Turtle Bone Identifications

The identified bone sample includes twelve plastron or carapace fragments large enough for identification and nineteen other bones (vertebra, pelvis parts, and phalanges, mostly). Note that a great number of turtle carapace fragments (458) too small for further identification were simply counted.

4.

Possibly two taxa of turtles or at least two sizes of turtles are represented in the sample. Some vertebral and phalangeal pieces match in size a turtle of about 25-30 cm carapace length, while others match a turtle about 10-15 cm. carapace length. One species, snapping turtle, is positively identified based on a ridged neural carapace fragment (Dr. Thomas French, Massachusetts Division of Fisheries and Wildlife, personal communication).

5.

Snake remains, comprised entirely of vertebrae, appear to come from at least two taxa. There is one very large taxon whose vertebrae are over 1 cm in antero-posterior length. These vertebrae exhibit a strong haemal process or spine which appears to be

characteristic of rattlesnakes and relatives (copperhead, water moccasin). Positive identification of timber rattler has been made (Dr. Thomas French, Personal communication). The second species is much smaller, without the haemal spine or process development. Without having access to an adequate comparative collection, the best match

axon represented by ment of a left dista

The best match appears from photographs to be Megaceryle, the Kingfisher

The "medium-sized" bone represented by a distal condyle of a tarsometatarsus. No further identification is possible at present.

8.

The large bird taxon is represented by the proximal end of a claw (third phalange) of raptor. A definite match to the osprey, Pandion haliaetus, has been made

"Large mammal" refers to which could only have come from deer Odocoileus animals, or possibly larger

"Medium mammal" is equivalent to dog, raccoon, or beaver in size.

"Small mammal" is equivalent to fox and Mustela-sized animals, or smaller.

12.

The "small carnivore/Mustelid" category is used for two carnivore phalanges that match Martes americana (Marten) or Mustela vison (mink) in size and morphology. However, many phalanges are difficult to identify with certainty, so these identifications are left non-specific

13.

"Beaver" refers to bones positively identifiable as Castor canadensis.

14.

"Muskrat" refers to bones positively identifiable as Ondatra zibethicus.

15.

Rabbit of hare
morphology structure minute
fragmentary for judgement of elements are equivocal rabbits
Since these two genera have basically different ecological associations in the northeast
(boreal vs. carolinian respectively), we leave the bone unassigned to genus.

16.

The identification of Odocoileus is based on identification of the distal 1/3 of a
third (hoof) phalanx as definitely cervid of Odocoileus size in general. It is
delicately enough built to be sure of its differentiation from Rangifer (caribou)
Although the distal Phalanx does not exhibit epiphyseal fusion which would allow
definite determination as skeletally adult or sub-adult, the piece is simply too small for
even young Cervus (elk) or Alces (moose)

It is considered likely on the basis of size and shape that all or most of the 7
"large" mammal bone fragments are Odocoileus also.

17.

One provenience has yielded three fragments of the articular end of a very large
mammal bone. All are basically trabecular bone, but two fragments exhibit articular
surface. One fragment exhibits a gently convex articular surface 2.5 cm wide, bordered by
a protrochanteric tubercle and an apparent bone edge at 90 degrees to the plane of the
articular surface. The gentle convex curvature of this one piece is very rare in
skeletons. This fragment was compared with all Odocoileus bones, and found to be
definitely from an animal larger than Odocoileus. The curvature of the bone indicates
that it is a proximal humeral articular surface of an artiodactyl. It is too large for

Odocoileus, Rangifer, or most Cervus except the very largest. It could match either Alces (moose) or Bison (buffalo), but the best shape match discovered after some searching is with an arthritic proximal humeral articular surface of Alces (moose): right humerus, lateral edge near the greater tuberosity. We regard the specific identification as

PING

an attempt to compare the subsistence patterns of the hypothetical early and late components at Wadleigh Falls, identified fragments were plotted on depth charts and arbitrarily assigned as "above" or "below" the probable assemblage dividing line derived from this assemblage analysis. Taxa identified in the lower component include turtle, rattlesnake, small snake, shad (4 of 8 bones), small mammal, small carnivore/*Mustela*?, beaver, and large mammal (one of 9 including deer and moose?). The assemblage assigned to the lower component perhaps represents 40% of the identified fauna. The only striking difference in the assemblages reconstructed for the site is the presence of a majority (8 of 9) of the large and very large mammal bone fragments in the upper component. Whether this distribution is culturally significant is impossible to say with such a small sample.

At best we can say that the faunal assemblages assigned to the upper and lower components are not noticeably different in general character.

THOUGHTS ON CALCINED BONE ASSEMBLAGES

Although unpublished, some significant bone calcination experimental work has been done recently at the University of Maine-Orono by Mr. Jay Knight, with Spiess as one thesis advisor. Knight's work indicates that calcination by itself is not enough to

reduce bone to such small fragments, but that it does make them much less resistant to stress fracture. Thus, the Wadleigh Falls sample indicates exposure to stress. Human passage and/or 7,000 years + of exposure to soil movement caused by frost action, root growth and burrowing fauna have reduced the bone to its current state

hab east ee m ages
each modify the or bone frequency First some refuse bone was discarded in or near enough to a campfire to be Other bone discarded about the site, which was not calcined, has not survived. Some sort of frequency selection for/against certain body parts of certain taxa may have occurred at this stage. Secondly, calcination itself shrinks the bone usually 10-15% in linear dimension and begins the process of bone breakage Thirdly, mechanical forces in the soil reduce the calcined bone to smaller and smaller pieces

In Spiess' experimental and subsequent size reduction of the resulting fragments favors the fragments from smaller taxa, because their smaller diagnostic elements are more remain visible. Thus, small-bodied species are likely to be "over" identified in broken calcined samples compared with uncalcined samples.

These caveats make impossible to compare meaningfully the frequencies of identified taxa in a calcined sample with an uncalcined sample. However, for calcined samples of approximately the same degree of breakage, differences in taxa frequencies do probably reflect some original difference in the subsistence strategy. Perhaps after Knight's work is complete, we will be able to work backward up the taphonomic chain of events and make comparisons between calcined and uncalcined assemblages.

DISCUSSION

There is a developing body of subsistence information from the Early and Middle Archaic of the Northeast based on samples of calcined bone scraps. Closely comparable in terms of sample size with Wadleigh Falls site is the Brigham site (ME 90.2c) in Millo

Wadleigh Falls site together
de a det se and Middle Archa adaptatio
nterior northern New Eng

Barber found evidence that the Buswell site on the Merrimack River estuary had been used as a fishing and hunting station during the Middle Archaic. Sturgeon, and at least two species of unidentified boney fishes were caught. The faunal sample was dominated by fish (72:42, fish:mammal ratio) with no bird or reptile bone preserved. Anadromous fish were presumably the focus of the Middle Archaic subsistence activities at this site

Thomas (1980) reported recovery of calcined fish, turtle, and other bones from Middle Archaic or Early Archaic in the WMECO site in the Riverside Archaeological

district in Massachusetts. The Walnut Street Trench in the Riverside Archaeological District has yielded a fish dominated calcined bone assemblage associated with plano-convex scrapers and a radiocarbon date of 8685 \pm 370 (GX-6995) from a depth of 85-95 cm B.S. in E07 (Curran and Thomas, 1979). Both shad and alewife were present in the sample, while turtle, snake and unidentified mammal were all secondary in frequency.

In a review of Middle Archaic sites in Western Maine, Spiess, Bourque and Gramly (1983) noted a very strong trend for Middle Archaic sites to be located around lake inlets and outlets, although a minority proportion were stream or river oriented. Bourque has tested one of these lake outlet sites, the Jon Lund site (ME 37.11) near Augusta, while Doyle and Hamilton have tested two lake inlet/outlet sites on Sebago Lake, the Linquest (13.3) and Leighton (12.7) sites. Spiess identified a sample of 314 calcined bone

fragments recovered from the Middle Archaic component at the Jon Lund site (see Table 3), and 165 bones from the Linquest and Leighton sites.

R. Michael Gramly has submitted for Spiess's identification a sample of about 30 calcined bone fragments from a Neville-related site near Spencer Lake (ME 101.1), north of

identifiable as beaver

The Brigham site in Pleasant Bay near Wadleigh Falls yielded a calcined bone assemblage from Middle and Early Archaic levels including shad, deer, bear, bird, turtle, snake and small fur bearers. At this site none of the taxa dominates the sample, and turtle and snake are a definite minority. Spiess identifications, report in process.

It is evident that the dominance of reptiles over mammal, bird, and fish at Wadleigh Falls may be repeated at the Linquest and Leighton's sites on Sebago Lake, but is not repeated at the Jon Lund's Brigham site, or site 101 in Maine. At the Buswell site and in the Riverside Archaeological District site in fish (anadromous where identified) dominate the assemblage.

However, at no site is there a "specialization" on one resource such as the resource constitutes more than 90% of the faunal sample. (In Spiess' experience such "specialization" especially on beaver, is common in Woodland/Ceramic period calcined bone assemblages from interior Maine.) There is, in all cases except the small sample from 101.1, a component of turtle, reptile and (anadromous ?) fish in the faunal sample.

Perhaps we can say that subsistence patterns in the Early and Middle Archaic showed a much lower frequency of seasonal or location specialization than did (later) Late Archaic or Woodland/Ceramic subsistence patterns. Yet subsistence of Early and Middle Archaic times was definitely variable from place to place ("non-normative"). Moreover, the low (most sites) or high frequency (Wadleigh Falls) reliance on reptiles does in Spiess' experience differentiate Early and Middle Archaic subsistence in the interior of northern

New England from the Woodland/Ceramic at least and probably from the Late Archaic adaptations as well. If we are to discover some "characterization" of Middle Archaic subsistence that sets it apart from later subsistence patterns, we know the job is not going to be simple. Quantitative comparison of calcined bone samples will, of course, help as the data base bu

Table 1
Artifactual Assemblages from Wadleigh Falls

<u>Tool Class</u>	<u>Upper Component</u>	<u>Lower Component</u>	<u>Total</u>
Projectile Point			
Neville	12 (2)		14
Neville *	2		
Stark	1		
Miniatur	2		
Point Fragment			
Unfinished pt *	4		
Biface Fragment	67 (6)	- (4)	77
Perforator	14	1	15
Bifacial Knife	8	-	8
Flake Knife	1	-	1
Spokeshave	3	- (1)	4
Graver	3 (3)	1 (2)	9
Casual Scraper			
on bif.frag	3	-	3
on flake	4	- (1)	5
Scraper			
on Bif.frag	2	-	2
on flake	4	- (1)	5
on Qtz core	- (4)	- (3)	7
Core/Core Frag.	3 (6) 2	- (9)	18
Hammerstone	7 (2)	1 (2)	12
Chopper \$	-	1 (1)	2
Abrader	7		
Full-Grooved Axe			
Possible gouge			
Worked chunk			
Unknown stone tool			
<hr/> Total	<hr/> 220	<hr/> 40	<hr/> 260

Total excavated debitage = 48,000 + pcs.

(1)=quartz tools

1 =all other materials

* these appear to be Neville types

2 most of these are from the lower part of the Upper component

\$ these are not formalized like those at Johnsen #3 (Funk and Wellman, 1984)

Table 2. Identified Bone Sample, Wadleigh Falls

	Number of Bones	Minimum Number of Individuals	Notes
Reptile			
Unid.			
Turtle		Multiple	3,4
Snake	94	Multiple	5
Bird			
Small			6
Medium			7
Osprey			8
Mammal			
Unid.	4	N/A	
Large	7	N/A	9
Medium	5	N/A	10
Small	6	N/A	11
Small Carnivore/ Mustelid			12
Beaver			13
Muskrat			14
Rabbit or Hare			15
Deer			
Very Large Mammal			

Table 3. Identified Bone Counts from ME 37.11 (Jon Lund site),
and ME 13.3 (Linquest) and ME 12.7 (Leighton's)

	ME 37.11	ME 3.2 and 12.7
<u>Castor canadensis</u> (beaver)	17	0
<u>Odocoileus</u>	12	4
<u>Ursus</u> (bear)	40	
<u>Onдатra</u> (muskrat)	50	
<u>Martes pennanti</u> (fisher)	2	
<u>Lutra</u> (otter)	1	0
<u>Mustela vison</u>	2	0
Small Canid	4	0
Snake		2
Turtle		140
Bird, not identifiable	6	9
<u>Gavia</u> (loon)	3	0
<u>Phalacrocorax</u> (cormorant)		0
Larid (gull)		0
Fish, not identifiable, very small		
Salmonid Unidentifiable	1	
<u>Salvelinus</u> (togue or lake trout)	1	
Catastomid (sucker)	3	
TOTAL	314	165

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THE PLANNING PROCESS

A Lamprey River Area Planning Committee was formed with membership from area conservation commissions, planning boards, sporting clubs and concerned citizens. Under the direction of SRPC staff, these individuals met on a near monthly basis to complete the project. The 22 LRAPC members and their affiliation are listed in Table III.

Committee members reviewed the inventory of river-related issues, assets and problems.¹ LRAPC members determined that six general subject matters were most important to them: establishment of a watershed association, water quality, fisheries, inadequacies in local river protection regulations, public access and associated problems and environmental education to promote awareness of the Lamprey's potential as a resource.

Development of Goals

At their first meeting to discuss goals, committee members noted that there may be problems working with data from the outdated Rockingham County Soil Survey. The Rockingham County SCS District Conservationist, present at the meeting, was requested to report the current status of updating soils maps for the study area. According to this report, only a small percentage of the mapping had been completed. However, if a formal request noting priority areas were filed with the SCS prior to March, the Rockingham County Conservation District would consider including those areas in mapping for the spring field session.

In order to fulfill this requirement, the committee's first action was to prepare the list in Appendix B. It was developed by comparing land use, zoning and land ownership within $\frac{1}{2}$ mile of the rivers. Already developed areas and areas in public ownership or otherwise protected were considered low priority for soils mapping. Prime areas of open space that were zoned for development received a high priority. The request was honored and the data compiled will be included in the soon to be updated Rockingham County Soil Survey. In the interim, the field survey is an available reference for planning purposes.²

Further meetings were held to refine the six priority areas into justifiable goals. Representation by varied interests on the committee led to comprehensive discussions of each subject matter. Committee members agreed that establishment of a permanent watershed association was crucial to implementation of their recommendations. Suggested activities included: developing a water quality monitoring program to determine key areas for fisheries and resource protection efforts, defining the major issues limiting safe and adequate public access to the rivers and environmental education to promote appreciation and wise use of the watershed's resources. The detailed goals of the Lamprey River Area Planning Committee are presented in Table IV.³

¹Information was presented in both narrative and graphic forms. (Maps at a scale of 1:1000 depicting environmental, cultural and recreational data for each town and the Final Report Cochecho and Lamprey Rivers, SRPC December, 1982 available for review at the SRPC Offices.)

²Preliminary data from the Rockingham County Soil Survey is available from the SCS Office in Exeter.

³Documentation of discussion leading to the goals can be found in Local Participation Development of Goals for the LRAPC, SRPC M. R., 1983.

TRANSCRIPT

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Vol. 17 No. 21

25c

On Protecting Our Open Land

DURHAM - Landowners from Durham, Lee, Madbury and Newmarket who are interested in the possibility of giving or selling land easements to their town conservation commissions, learned all the facts and benefits at a meeting on May 12.

Held at the Hannah House Bed and Breakfast of Dick and Bea Dewey on Packers Falls Road, the meeting was attended by some 40 conservationists and landowners.

Speakers were Roberta Jordan, land agent for the Trust of New Hampshire Lands, and Judith Spang of the ad hoc committee on conservation lands.

Spang explained that the ad hoc committee was formed a year ago, with representatives of the conservation commissions of Lee, Madbury, Newmarket and Durham, the University of New Hampshire's Natural Areas Committee, and the Lamprey River Watershed Association. Representatives from the four towns were seeking to select open land to be protected. At the same time, UNH was concerned that their open lands might be cut off by development, forming habitat islands. Through a process of mapping currently protected land and remaining open lands, potential corridors could be seen which cross town boundaries. These were then prioritized; using both the conservation commission goals of each town and the selection criteria used by the Trust for N.H. Lands for their program. Selected corridors chosen included Crommett's Creek (Durham Point area), the Follett's Brook area in Durham, Newmarket and Lee (west of Packers Falls Road, between Wiswall and Lee Hook roads), and the Lamprey River watershed.

Spang explained why each had been selected. The Crommett's Creek area south of Dame Road completes a decade of work to acquire a band of land from Durham Point Road, near the landfill, to Great Bay, she said. It was chosen because it is also an invaluable wildlife habitat, and because land use along the creek will have a significant impact on the threatened water quality of Great Bay.

The Lamprey River was chosen for several reasons - its scenic beauty (it is listed on the National Inventory of Potential Wild and Scenic Rivers because of its scenic qualities); the purity of its water (the Lamprey River Watershed Association monitored it for two years and found it to be very clean, and it is Durham's secondary water supply); its importance for fish (named by the State Legislature and General Court as one of the most important rivers in the state for anadromous fish); and its relative lack of development. Spang pointed out that 'it is remarkable that a river of this quality can still be protected, in a county which is one of the fastest growing in the nation.' In the future, whatever land is left will be too expensive for towns to acquire, she said, while if it is saved now, the Lamprey will be a treasured recreational and scenic asset to the fully-developed towns. The Lamprey also empties into Great Bay, and impacts its water quality.

Spang went on to explain that the Follett's Brook area is valued for the size and diversity of marshes, upland woods and open fields, which provide a very rich habitat for wildlife, including wild turkey, deer, black bear and red-shouldered hawks. Follett's Brook is also the town of Newmarket's water supply. Where landowners have allowed public use, the area is enjoyed by snowmobilers, skiers, horseback riders and hunters.

Roberta Jordan was then introduced, and began by emphasizing that landowners are invited to participate in land conservation programs on a strictly voluntary basis. The towns have no intention of pressuring landowners within the selected areas who have other goals for their lands, she said.

'We're giving you the means to achieve some conservation goals that perhaps you've had,' Jordan continued, 'and now, with the Trust for N.H. Lands money, there's a way to be compensated at the same time.'

As a land agent for the Trust for N.H. Lands, Jordan's job is to inform landowners about land protection options, and about the Trust in particular. The Trust is a public/private partnership, with \$20 million allocated by the legislature for the acquisition of conservation land throughout the state, and \$3 million of privately-donated money for public information and administration.

Jordan described various advantages and mechanisms for landowners to protect their open land. The first consists of conservation easements, 'an alternative to giving land away,' she suggested, and, 'it stretches the resources we have.'

A conservation easement, Jordan said, essentially places a provision in the property deed that prevents any building of structures on the land, no matter who buys it in the future. Other non-development uses, such as farming or logging, can continue, however.

'Conservation easements are flexible, used in a variety of situations. For example, they're used to protect river corridors. If you can interest a group of landowners along a single corridor in all donating an easement on the first 150' of river frontage, that can protect a stretch of river corridor for a long, long way. You don't have to give an easement over your whole property. In certain cases, easements can allow public use of your property, in certain cases, it won't - that's really up to the discretion of the landowner. The landowner may want to restrict certain parts of their land and leave parts out for their children or grandchildren. You can tailor it to meet your specific objectives.'

Jordan then explained three circumstances under which giving or selling conservation easements would benefit the landowner.

1. Estate Planning. 'In the last 10 years,' Jordan said, 'New Hampshire landowners have watched their land go from something they paid \$100 for 40 years ago to something that's now worth hundreds of thousands, sometimes millions of dollars. For families who want to keep that land in their family, it poses problems if a piece of land becomes so valuable that at the time of death it can't be passed on without incurring a federal estate tax.'

For landowners who wish to leave their property to their heirs, estate taxes can be very high, Jordan said, adding that on any property valued over \$600,000 - not uncommon on larger parcels in this region - the estate taxes can be up to 50% of the value over that limit. This may force the heirs to sell land to pay the taxes. Donating or selling an easement on certain portions of the land before it is inherited will keep the land in the family's ownership, but so reduce its taxable value that it becomes affordable from a tax standpoint.

'Obviously, if you donate that easement, you don't have that \$600,000 back in cash, subject again to taxes,' she concluded.

2. Income Taxes. On the other hand, Jordan pointed out, if a landowner decides to sell his land, he is faced with a capital gains tax on the amount his land has risen in value since he acquired it. On older properties in southern N.H., this increase in value is substantial. The capital gains tax can be reduced if the landowner makes a gift of one piece of his property (or sells it at a reduced rate) to the town, or places a conservation easement on it at the same time that he is selling or developing other parts of his land. In other words, he offsets the gains from selling some of his land by donations of other pieces. Developers can also take advantage of this means of tax reduction, Jordan said.

3. Property Taxes. Once land is under a conservation easement, it will be reduced in its assessed value, Jordan said.

'Even if current use should go out of business, it would still be taxed at its highest and best use, which would be at an open space rate.'

To receive Trust for N.H. Land money, the land or easement must go to either a town, the state, or a state agency, such as Fish and Game, Jordan explained. Other nonprofit groups, such as the Nature Conservancy, Audubon Society, and the Great Bay Research Reserve each have their own programs. She recommended that landowners contact their conservation commissions for details.

Jordan then described the Trust for N.H. Lands, which offers funds for towns to buy conservation land or easements. She pointed out that land considered to be of statewide importance can receive 100% of its value from the Trust. For lands of local value, the towns must provide 50% of the cost. This can be in the form of either town appropriations or the value of land which has been openly donated by landowners. If a landowner donates land, it can be used as the local match for the town to buy more land - plus the landowner gets all the income tax benefits of a charitable gift.

Jordan also described the application procedure for the Trust program. The Trust will determine whether the property in question has sufficient conservation value to be eligible for the program, she said, and since lands in the corridors were chosen using Trust criteria, they are likely candidates.

Some concern was expressed by those at the meeting that this program did not provide money for the necessary appraisal and surveying of land, and that this may fall on the landowner. However, several conservation commission members and townspeople in the group felt that the towns could be asked to provide for this expense. Both Jordan and the conservation commissions will help landowners with applications, the group was told.

Spang then pointed out that even if a landowner did not choose to donate or sell conservation easements, much could still be done to help in protecting these corridors: keeping existing vegetation along the water's edge, not fertilizing heavily down to the water or allowing animal waste to leach into it, considering the scenic view from the river when planning new structures, and encouraging neighbors to participate in the corridor protection effort.

Supporting land acquisition requests at town meetings is also an important way to help, Spang suggested. Above all, she said, landowners in the designated corridors are urged to contact their conservation commissions before changing the status of their property, or when doing their estate planning, so that their options could be explored further.

Jordan said she was available to meet with any landowners interested in protection of all or part of their land. She may be reached at 778-0504.

In closing, Spang said, 'There is a whole range of ways landowners can think about protecting their land, whether it's in the process of working with a developer, passing it on to their heirs in a way which will help to preserve parts of it (or all of it), or, if people are concerned that some land remains open for the future residents of the town, finding out about some of the mechanisms now available.'

When coffee was served after the formal discussion, property owners had an opportunity to discuss things further with Jordan and the conservation commission members present. The consensus seemed to be that many landowners were interested in finding out more, and that the concept of creating these conservation corridors was enthusiastically received.

Town of Durham

MASTER PLAN UPDATE

FINAL REPORT

May 1989



for a gross land requirement of 1,500 square feet per student (including 300 SF of living space, 200 SF for parking space, and an additional 1,000 SF for common functions, interior roadways, landscaping, etc.), approximately 35 acres would be required to accommodate 1,000 students. There would be no measurable impact on the town resident housing stock.

Lastly the scenario for restricting growth has essentially a reverse impact to the last two. Rather than proposing development which would consume land this option would reduce the impact of land utilization in the first scenario by reducing the number of projected dwellings by 200 to 400 units. This would result in a reduction of 300 to 600 acres in residential development leaving approximately 700-1000 acres to be developed under this scenario.

In summary, depending on the direction taken by the committee, the approximate amount of land which would be developed through the year 2010 in Durham would range between 700 acres up to nearly 2,100 acres.

COMMUNITY OPINION ON LAND USES IN DURHAM

In addition to the specific topics which have been discussed in the previous chapters regarding the location of future housing, commercial centers and public facilities, several questions on the survey dealt specifically with some issues related to the preservation of currently undeveloped land and historic resources.

→ On the conceptual level, there was strong support voiced in favor of preserving natural resources which might otherwise fall victim to development pressures. The protection of wilderness areas and land along waterways received the most vigorous support, followed by water source areas, active farm land, scenic vistas from roadways, and land near settled neighborhoods. However, this question did not include any recognition of funding sources to accomplish such preservation nor the impact that such activities might have on taxes.

GOALS AND RECOMMENDATIONS

Goal: Provide for a well-balanced land use pattern to meet present and future community needs in an efficient, environmentally sound, economical and equitable manner, and to preserve and protect open space for conservation and recreation purposes.

Objectives:

1. Discourage development which will result in a scattered, inefficient land use pattern.
2. Encourage the separation of future University related housing from local resident housing.
- 3. Protect environmentally sensitive areas in the town, including water sheds, aquifers, coastal shorelines, floodplains and stream banks.
- 4. Preserve scenic areas, prime agricultural lands, wildlife areas and conservation/recreation corridors (consistent with other land use recommendations).
5. Develop both active and passive recreational facilities to serve the diverse needs of both existing population and projected future growth.

Analysis:

Current land use patterns in Durham show somewhat scattered development, loss of open space, loss of agricultural land, pressure on water resources and pressures on the remaining parcels of developable land. A mix of student housing and permanent residences have created conflict due to differing lifestyles. To make changes in

TOWN OF DURHAM EXISTING RECREATION FACILITIES

Introduction

The next time you're looking for some outdoor recreation, be it anything from enjoying a scenic view to playing tennis, take a good look at what your own town has to offer. Right here in Durham there are over 900 acres of publicly owned (UNH, Durham, State) outdoor recreation property providing at least sixteen different activities and access to seven different bodies of water. There are nineteen separate sites, each one offering something a bit different from the rest.

Adams Point Wildlife Area-80 Acres (State)

Habitat: Fields, woodlands, tidal marsh and bay
Trails: 0.7 to 1.3 miles, depending on which loop is taken; all clear and dry
Boating: All types in Great Bay-boat ramp
Picnicking: No facilities
Note: N.H. Fish and Game Reserve
Monument in memory of Adam's family
Site of UNH Jackson Estuarine Laboratory
Unique stone bench on the southeast tip
Only waterfowl hunting permitted

Cedar Point (Town and State)

Habitat: Tidal river, bay
Boating: All types in Little Bay and Bellamy River
Boat ramp at end of Cedar Point Road (a)
Picnicking: Three barbecue pits (b)
Note: Two separate sites (a and b)
At corner of Route 4 and Cedar Point Road is a historical marker for the former site of a bridge to Newington via Goat Island, and also once the proposed site of N.H.'s capital.

Colby Marsh-15 Acres (Town)

Habitat: Beaver Pond, wildlife area
Note: Access via Longmarsh Road
No trail, Abuts Langmaid Farm.

College Woods-240 Acres (UNH)

Habitat: Reservoir, freshwater river, extensive woodlands, natural area
Trails: Length estimated 3-4 miles
Picnicking: No Facilities

Davis Park-12 Acres (UNH)

Habitat: Heavily wooded; trees unusual for this area, planted species include: Scotch pine, balsam fir, Eastern larch, white spruce, Norway spruce, Douglas fir
Trails: None developed

Doe Farm Forest-80 Acres (Town)

Habitat: Fresh water river, woodlands, wetlands
Trails: Class VI entrance road, 0.5 miles; two miles additional trails, clear and dry
Boating: Limited to canoes and rowboats-no ramp, launching difficult; one half mile portage required
Picnicking: No facilities
Swimming: River bottom extremely soft; no beach
Note: Site includes most island to the south-east in the Lamprey River

East Foss Farm-165 Acres (UNH)

Habitat: Field, woodlands, wetlands
Trails: 1.7 miles for loop including Class VI entrance road

Horseshide Creek Area-50 Acres (Town)

(Town Dump Lot and Johnson Lot)
Habitat: Woodlands, marsh, solid fill, steep slopes on Horseshide Creek
Trails: To be developed
Note: Abuts Langmaid Farm

Jackson Landing-4.5 Acres (Town)

Habitat: Tidal river and marsh
Boating: Ramp-access for all boats: boat shed & dock shared by UNH and Town
Picnicking: No facilities
Skating: Municipal outdoor skating rink; small warming hut

Langmaid Farm-46 Acres (Town)

Habitat: Woodlands, field, brook, wildlife habitat, view of Colby Marsh
Trails: One mile lightly marked
Note: Abuts Colby Marsh and Horseshide Creek

Linn Ponds-3 Acres (Town)

Habitat: Two small marsh, freshwater ponds

Mill Pond (Town)

Habitat: Freshwater pond and marsh
Boating: Limited to canoes and rowboats; no ramps
Picnicking: Two benches
Note: Home of Agatha and Hamilton, two locally famous swans

Old Reservoir and Hordt Farm Woods-155 Acres (UNH)

Habitat: Freshwater pond and marsh; managed woodland
Trail: Approximate mile
Picnicking: No facilities

Oyster River Landing/Shipyard Landing-3 Acres (Town)

Habitat: Tidal river, and marsh
Boating: Launching limited to canoes and rowboats-no boat ramp; dock provides access to boats moored in river
Picnicking: Six picnic tables, two stone benches
Note: Wooden plaque depicts the area in 1800's when it was the center of activity in the town

Oyster River Park-4.5 Acres (Town)

Habitat: Regularly mowed fields, woodlands along Oyster River
Trails: 0.4 miles along the river; partly grown over but passable
Picnicking: No facilities

Packer's Falls-3 Acres (Town)

Habitat: Freshwater river, with falls
Trails: 0.4 mile network through woods
Boating: Limited to canoes and rowboats downstream from falls; launching difficult-no boat ramp
Picnicking: No facilities

West Foss Farm-93 Acres (UNH)

Habitat: Woodlands, and pasture
Trails: 2 miles for loop at Mill Road entrance; also 1.3 miles for trail from West Foss Farm to Bennett Road; clear, seasonally muddy

Wiswall Dam-2.5 Acres (Town)

Habitat: Freshwater river, woodlands
Trails: Less than 1/4 mile on site
Picnicking: No facilities

Woodridge Recreation Area-5 Acres (Town)

Habitat: Regularly mowed open field
Note: Father Lawless Field; baseball diamonds, soccer field, four tennis courts

TABLE 4-3 (continued)

Water

Water distribution in Durham is another of the services that involves both the town and the University. The University is responsible for maintaining and operating the treatment of the municipal water supply, while the Town provides maintenance and operation of the distribution system. The prime source for the water treatment plant is the Oyster River, directly west of the railroad tracks. → A supplemental source to this site is provided in a direct feed from the Lamprey River due south of this site. Based on the findings of a report prepared for the University concerning the treatment plant facility by Dufresne & Henry in 1984, the identified capacity of the treatment plant was 1.4 MGD. However, the same report also noted that raw water and impoundment capacity when combined with the volume of the back-up system out of the Lamprey was closer to 4.2 MGD. However, due to existing treatment plant capabilities, this volume is in actuality unattainable. Another source of water to the town is provided at the recently constructed Lee Five Corners Well. This source was intended to serve the Data General facility, as well as providing domestic water to the western part of the town along Old Concord Road. A study prepared by Groundwater Associates indicated the actual capacity of this new well at .5 MGD.

In terms of providing new service, the primary area focus should be to the south along the Newmarket corridor. This, when combined jointly with the proposed sewer extension, would greatly enhance development capacity for this area.

Buildings, Recreation and Cemeteries

The third primary service provided by the Durham Department of Public Works is maintenance of town-owned buildings, recreation areas and cemeteries. In terms of buildings, the three primary buildings that the town maintains are the Henry Davis Memorial Building, the Municipal Court, and the Town Hall. A list of the other facilities that the town owns and maintains, along with identified recreational areas is presented in Table 4-3.

CONSERVATION

In Durham, the issues relating to conservation are closely interwoven with other elements contained in this Master Plan. Many of the recommendations concerning future land use in the Town of Durham are based on a strong desire to protect the natural resources that make Durham attractive to so many of the town residents.

Historically, issues relating to conservation have been addressed by the Conservation Commission. The Commission has established a list of thirteen farms that it would like to protect and maintain as undeveloped open space. In addition to the proposed protection of these thirteen farms (of which several are being actively farmed), a concept of developing natural wildlife corridors is also being utilized. This concept has also been the focus of an ad hoc committee on conservation lands which includes representatives from the Conservation Commissions of Durham, Lee, Madbury, and Newmarket, the Lamprey River Watershed Association and the UNH Natural Areas Committee.

→ Attached as Appendix 4 is a position paper from the Committee which further details the need and purpose for the corridors. Also attached is a memorandum from the committee which specifically discusses the status of the Follett's Brook watershed.

These two concepts were viewed as being desirable, in terms of meeting future town conservation objectives. Several other proposals were suggested as being viable methods to help achieve these two objectives. Further strengthening land use regulations, especially in terms of impact on natural resources, would, in effect, help in the preservation of undeveloped land, as well as in establishing conservation corridors. Changes in land use regulations could include: increasing building setback distances along Great and Little Bay shorelines and streams; more stringent development guidelines on identified aquifers; enforcing wetland and floodplain measures; and mandating recreational set-asides for new subdivision approval. The town could also explore other methods of conservation

enhancement in addition to fee simple purchase and acquisition of development rights, including transfer of development rights, voluntary conservation easements, participation in the program administered by the State Conservation Land Trust, and encouragement of cluster housing.

PARKS AND RECREATION

Parks, recreational areas and open space are important components of a community. They contribute greatly to the physical, mental and emotional health of the population. Under the direction of the Parks and Recreation Committee, a recreation master plan is being established by reviewing current needs and by using the 1984 Recreation Master Plan as a guide.

Durham must be cognizant of both state and national recreation standards. In many areas, this community meets or exceeds these standards. Durham does however, fall short in the number of playgrounds, the acres of playgrounds, the acres of picnic areas, the acres of campgrounds and the number of campsites among others. These standards are meant as a guide for communities and each community must decide what needs and facilities should be addressed. This will be the goal of the Parks and Recreation Committee (see Appendix 5 for Park Standards).

Neighborhood parks form the basic park unit in a community. They should be located to provide easy and immediate access to the surrounding residents, typically within a walking distance of 4-6 blocks maximum (1/4-1/2 mile radius). Durham must focus on the development of this type of park to meet the need for this basic type of park unit. Other major issues are as follows:

1. There is little connection between established parks other than by auto. Pedestrian and bike trails are almost non-existent;
- 2. The Oyster and Lamprey Rivers do not have sufficient development and access for recreational uses;

LAND USE RECOMMENDATIONS

1. New housing development should initially be encouraged to occur on already approved lots and in the area accessed by Route 108 and north of the Oyster River, excluding lands which are to be retained for conservation and restricted from development.
2. Adopt a policy for long term housing development to be encouraged in three areas in the following priority: (1) the area accessed by Route 108 and north of the Oyster River which remains available, (2) a portion of the area south of the Oyster River and east of Route 108 accessed by Durham Point Road, and (3) the Mill Road area.
3. In concert with municipal water and sewer extensions, rezone areas over time to appropriately allow for smaller lot sizes, so that the need for new roadways and utilities will be minimized. This will also help to reduce housing costs and attract development which may otherwise be more scattered throughout the town.
4. Work to develop more off-campus student housing in an area west of the main campus. Revise permitted uses in the O/R and adjacent zones to allow for student housing development.
- ✓ 5. Identify, prioritize, and preserve properties which the town Conservation Commission has determined require protection by such methods as setback requirements, fee simple purchase of properties, acquisition of development rights, transfer of development rights and density bonuses.
6. Work with the University to determine existing and potential deed restrictions which may protect certain University properties for conservation purposes.
7. Encourage UNH to expand westerly and use high rise facilities where practical. A westerly expansion will help preclude incompatible land use between UNH and established residential neighborhoods.

8. Employ methods such as the extension of water and sewer, zoning changes, transfer of development rights and clustering to guide development and minimize any adverse impacts which may result.
- 9. Establish new shoreline protection zones that distinguish between major and minor water bodies. Adjust existing setback distances for these new zones
- 10. Establish an aquifer overlay protection zone to minimize intensive development on environmentally sensitive aquifers and aquifer recharge areas.
- 11. Establish a watershed overlay protection zone along rivers serving as existing and potential domestic water supply.
12. Continue town participation in the New Hampshire Coastal Program administered through the Office of State Planning.
13. Obtain conservation easements to complete preservation of the Crommett Creek/Durham Point corridor for conservation and passive recreation purposes.
- 14. Support the recommendations of the Conservation Commission and the Ad Hoc Committee on Conservation Lands aimed at preserving both active and inactive farms and conservation corridors within the town. Consider conservation easements, fee simple purchase and transfer of development rights. Further, explore all outside funding sources, including the State Land Conservation Investment Program.
15. Develop a rating system for prioritizing undeveloped land for conservation and recreation needs.
16. Continue cooperative efforts between the town, UNH, Oyster River School District, and the Oyster River Youth Association in planning use of recreation facilities and programming for recreational needs.

Does Durham need additional parks or recreational facilities?

63 Yes 102 No 29 No Opinion

Schools

22. Please indicate the number of persons in your household currently attending any of the following by placing a number under each grade category.

	<u>K-5</u>	<u>6-9</u>	<u>9-12</u>	<u>Univ/ College</u>
Oyster River Schools				
Private schools				
(including colleges)				
Vocational schools				
UNH, Durham				
Other (specify)				

23. Does Durham need additional schools?

10 Yes 91 No 67 No Opinion
If YES, where should they be located? (Town and location, if known)
22 Yes with location

Location and extent of growth

How do you feel about residential growth in Durham?

7 favor rapid growth 116 favor slow growth
70 favor little or no growth 3 no opinion

Should Durham expand water and sewer lines to new areas?

75 Yes 67 No 53 No Opinion

26. Should increased density of housing be permitted in areas served by sewer and water?

57 Yes 106 No 30 No Opinion

27. The Trust for New Hampshire Lands and other sources provide money for a town to use in protecting open land, if the town shares in the cost. Would you support Durham's protecting land under such programs?

167 Yes 11 No 16 No Opinion

28. Do you feel that Durham should encourage the preservation of any of the following? (check all that apply) (see next page)

- 172 wilderness areas for wildlife, hiking and skiing
- 123 open space providing scenic views from road
- 170 land along rivers and Great Bay
- 84 land near settled neighborhoods
- 137 active farm land
- 159 water source areas
- 4 none

(Any specific areas where land should be protected? List them) 52

SAMPLE = 200

15

30 Yes 22 No 90 No Opinion
If YES, specify 47 Yes with support

30. When open land paying reduced Current Use taxes is developed, the developer must pay a penalty. How should the Town use this penalty money?

→ $\frac{148}{40}$ should be used to preserve other open space
 4 should go into the General Fund
 4 both

Personal

31. Please check the one category which best describes your household:

<u>16</u>	single person living alone
<u>12</u>	single parent with children in residence
<u>71</u>	married couple with children in residence
<u>92</u>	married couple, no children in residence
<u>3</u>	related individuals (other than above)
<u>10</u>	unrelated individuals
<u>5</u>	both related & unrelated individuals

32. Please indicate the number of persons in each age category residing in your household.

	category	residing	in
	1	2	3
18	6		
15	4		
17	6		
28	9	1	1
25	6	2	1
40	45	2	
41	54		
22	19		
12	10		

(Circle the age category above that includes respondent)

	1	
	2	
	3	
15-19 -	4 -	1
20-24 -	5 -	13
25-29 -	6 -	63
30-34 -	7 -	77
35-39 -	8 -	27
40+ -	9 -	14

TOWN OF
DURHAM
 NEW HAMPSHIRE
 DURHAM PLANNING BOARD
 AND
 NEW HAMPSHIRE DEPARTMENT OF RESOURCES AND ECONOMIC DEVELOPMENT

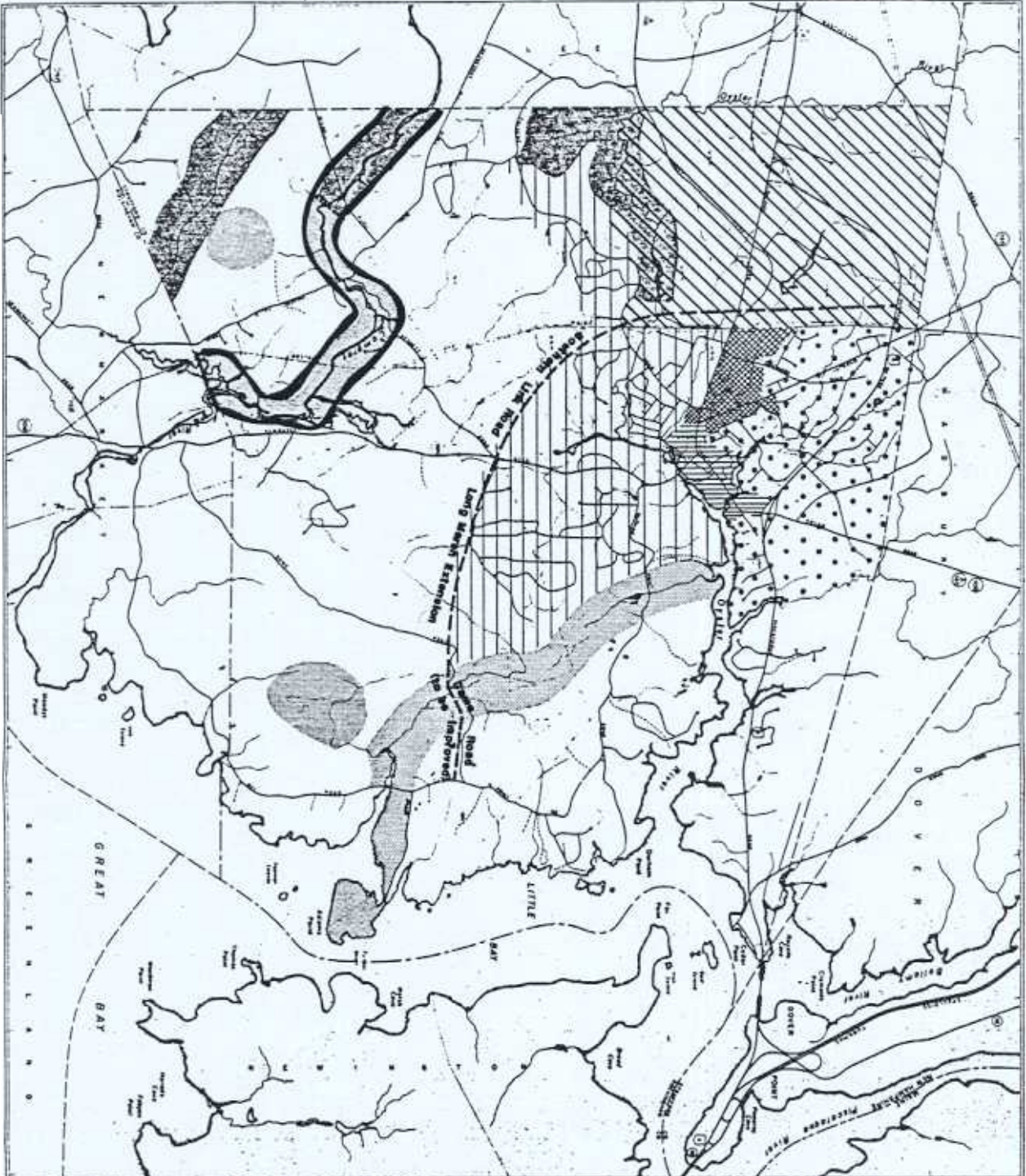
SCALE
 1" = 1 MILE
 1" = 1 KILOMETER

FUTURE LAND USE PLAN
 LEGEND

-  CENTRAL BUSINESS DISTRICT
-  TRANSITION BUSINESS DISTRICT
-  HIGH DENSITY RESIDENTIAL (SINGLE FAMILY AND ELDERLY (WATER & SEWER))
-  MEDIUM DENSITY RESIDENTIAL
-  LOW DENSITY RESIDENTIAL COASTAL & RURAL
-  WILDLIFE AREAS / RECREATIONAL CORRIDORS
-  OFFICE/RESEARCH
-  WATER SUPPLY / AQUIFER PROTECTION

ORIGINAL PREPARED BY:
 THE PLANNING SERVICES GROUP INC.
 CAMBRIDGE MASS. 02142

FIRST FROST
 LACONIA, NEW HAMPSHIRE
 FIRST FROST ASSOCIATES, P.C.
 95 DOW FALLS, NEW YORK
 CONSULTING ENGINEERS



Z O N I N G
O R D I N A N C E

L E E
N E W H A M P S H I R E

M A R C H

9 8 9

SUMMARY

ARTICLE XI: SHORELAND CONSERVATION DISTRICT

There shall be no: roads, driveways, parking areas, dwellings or other structures, waste water disposal systems; nor any excavation or filling (unless approved by the Planning Board) within **100 feet** of the shores of Lee's rivers, brooks and ponds.

Cutting of vegetation is limited to 50%, leaving a well-distributed cover of trees and other vegetation. Minimum lot size: 2 acres.

ARTICLE XII: WETLANDS CONSERVATION ZONE

Prevents erection of structures within 75 feet of any wetland (poorly or very poorly drained soil, or surface waters); and septic tanks or leach fields within 125 feet of any wetland. No dredging or filling of a wetland is permitted.

ARTICLE XIII: AQUIFER CONSERVATION DISTRICT

Prohibits: more than 10% of a lot from being covered by impervious surfaces; storage of hazardous or toxic materials; discharge of process waters on site; subsurface petroleum product storage; septage and solid waste disposal

3. Agricultural waste originating on, or for use on, the property on which it is deposited or stored;

4. At any private disposal site approved by the Planning Board upon finding, after public hearing, that it does not constitute a nuisance or be injurious to the public health and the environment or be detrimental to adjacent properties and providing it shall comply with all applicable rules and regulations promulgated by the State Bureau of Solid Waste Management, the State Division of Public Health Services, and the U. S. Environment protection Agency.

B. Unless otherwise specified, the words and terms used in this article shall be defined by reference to the same words or terms in appropriate state statutes or regulations.

ARTICLE XI

SHORELAND CONSERVATION DISTRICT

The intent of this district is to protect the water quality, visual character and the wildlife habitat of the shoreland areas.

A. SHORELAND DISTRICT DEFINED.

The Shoreland Conservation District shall be all land located within one hundred (100) feet of the shores of the Lamprey River, Little River, North River, Oyster River, Dube Brook, and Chelsea Brook and Wheelwright Pond. For the purposes of this ordinance, shore shall be defined as the average high water line of the above bodies of water.

B. RESTRICTIONS

Within this district the following restrictions shall apply (except where otherwise permitted or required by State or Federal regulations):

- a. There shall be no roads, driveways or parking areas;
- b. There shall be no permanent or temporary dwellings or other structures established with the exception of structures necessary for the housing of pumps;
- c. There shall be no waste water disposal systems;
- d. There shall be no excavation or filling unless approved by the Planning Board (review by the Conservation Commission will be requested).
- e. Cutting/ removing vegetation within the Shoreline Conservation District except where permitted under the provisions of this section shall be prohibited. No more than 50% of the basal area of trees shall be cut or otherwise felled, leaving a well distributed cover of healthy, growing trees or other vegetation within the Shoreline Conservation District.

Unbroken vegetative cover for wildlife travel lanes is an important consideration for the Shoreline Conservation District. Basal area shall mean the cross-sectional area of the stem of the plants at a height of four and one half (4.5) feet above the ground, usually expressed in square feet per unit of land area. Persons who wish to exceed the 50% limitation for some permitted use (such as water access) must secure prior written approval from the Conservation Commission. Requests must be accompanied by detailed landscaping plans. Evaluation of request to exceed the 50% limit will be based on a premise that each two hundred (200) linear feet of shoreline in the Conservation District comprise separate evaluation units.

C. PERMITTED USES

Within this district, the following uses are permitted:

1. Wells;
2. Unpaved footpaths;
3. Dry hydrants if necessary.

D. MINIMUM LOT SIZE

All land in the Shoreland Conservation District may be considered part of the minimum lot size as required under Articles IV and V of this ordinance. Any nonconforming structure may be continued, if that structure was lawfully existing before the passage of this ordinance. This nonconforming structure may be restored, if destroyed by fire or other natural causes, but if discontinued for more than twelve (12) months, subsequent use shall comply with the provisions of this ordinance.

ARTICLE XII

WETLANDS CONSERVATION ZONE

A. PURPOSE AND INTENT

The purpose of this article is to protect the public health, safety and general welfare by controlling and guiding the use of land areas which have been found to be subjected to high water tables for extended periods of time.

It is intended that this article shall:

1. Prevent the development of structures and land uses on naturally occurring wetlands which will contribute to pollution of surface and ground water by sewage or toxic substances;
2. Prevent the destruction of, or significant changes to natural wetlands which provide flood protection;
3. Protect unique and unusual natural areas;
4. Protect wildlife habitats and maintain ecological balances;
5. Protect potential water supplies and existing aquifers (water bearing stratum) and aquifer recharge areas;

2. ESTABLISHMENT OF A ZONE

The limits of the Wetlands Conservation Zone are hereby determined to be areas subjected to high water tables for extended periods of time and includes, but are not necessarily limited to all such areas delineated as wetlands of the current Town of Lee Wetlands Map, which is on file in the office of the Planning Board.

3. WETLANDS INCORRECTLY DELINEATED

Where it is alleged that an area has been incorrectly delineated as a wetland, or that an area not so designated meets the criteria for wetlands designation, the Planning Board shall determine whether the regulations contained herein have application.

The Planning Board shall make their judgement under this section only upon the determination by a qualified soil scientist(s) on the basis of additional on-site investigation or other suitable research that the information contained on the Wetlands Map is incorrect. This evidence shall be acceptable only when presented in written form by said scientist(s) to the Planning Board. Any necessary soil testing procedures shall be conducted at the expense of the landowner or developer.

D. RELATION TO OTHER ZONES

Where the Wetlands Conservation Zone is superimposed over another zoning district, the more restrictive regulations shall apply.

E. PERMITTED USES

Permitted uses are those which will not require the erection or construction of any structures or buildings, will not alter the natural surface configuration by the addition of fill or by dredging and uses that otherwise are permitted by the zoning ordinance. Such uses may include the following:

1. **FORESTRY TREE FARMING** using the best management practices in order to protect streams from damage and to prevent sedimentation;
2. **CULTIVATION AND HARVESTING** of crops according to recognized soil conservation practices, including the protection of wetlands from pollution caused by fertilizers, pesticides and herbicides used in such cultivation;
3. **WILDLIFE REFUGES**;
4. **PARKS AND RECREATION** uses consistent with the purpose and intent of this ordinance;
5. **CONSERVATION AREAS** and nature trails;
6. **OPEN SPACES** as permitted or required by the subdivision regulations or the zoning ordinance;
7. **FIRE PONDS** as approved by the Lee Conservation Commission, the Lee Planning Board, and the Lee Fire Chief.

F. SPECIAL EXCEPTIONS

Special exceptions may be granted by the Board of Adjustment, after due public notice and public hearing, for undertaking the following uses in the Wetlands Conservation Zone, when the application has been referred to the Planning Board, the conservation Commission, and to the Health Officer for review and comment at least twenty (20) days prior to the hearing. Special exceptions shall be required for the following uses:

1. **STREETS**, roads and other access ways and utility right-of-way easements, including power lines and pipe lines, if essential to the productive use of land not so zoned and if so located and constructed as to minimize any detrimental impact of such uses upon the wetlands.

2. **WATER IMPOUNDMENTS**

3. **THE UNDERTAKING OF A USE NOT OTHERWISE PERMITTED** in the Wetlands Conservation Zone, if it can be shown that such proposed use is not in conflict with any and all of the purposes and intentions listed in Section A of this article.

G. SPECIAL PROVISIONS

1. No **SEPTIC TANK OR LEACH FIELD** may be constructed or enlarged closer than one hundred twenty-five (125) feet to any wetland.

2. No **STRUCTURE** with the exception of wells and wellhousing shall be constructed within seventy-five (75) feet of the wetlands zone.

3. All land included in the Wetlands Conservation Zone shall be appraised for tax purposes at its full and true value in money, based on its market value as undevelopable land required to remain in open space.

ARTICLE XIII

AQUIFER CONSERVATION DISTRICT

A. PURPOSE AND INTENT

The purpose of this article is to protect the public health, safety and general welfare by providing for the protection and preservation of existing and potential groundwater resources, known as aquifers, in the Town of Lee, New Hampshire.

Incidents of contamination and shortage, occurring locally as well as nationwide, have brought forth concern regarding the necessity of planning for the protection of groundwater resources. Once considered an unlimited and unspoilable resource, the water supplied by aquifers in many New Hampshire towns has been made useless due to contamination. Some towns have been forced into expensive projects in order to meet the public's need for water.

It is, therefore, the intent of this article to protect our known aquifers by preventing adverse land use practices and by limiting the kinds of development which are inconsistent with the preservation of potable groundwater supply. This district will be managed in the interest of providing water of acceptable quality and adequate quantity for the use by present and future generations of Lee residents (and possibly of neighboring towns with whom we share aquifers and the desire to use them wisely).

B. DISTRICT BOUNDARIES

1. **AQUIFER CONSERVATION DISTRICT** is identified as those areas depicted on the Lee Zoning map which are designated as having the potential to yield groundwater. This designation is based on the U. S. Geological Survey Map entitled "Availability of Groundwater in the Piscataqua and other Coastal River Basins of Southern New Hampshire", (Water Resources Investigation 77-70, 1977) and on the U. S. Soil Conservation Service map entitled "Soil Survey of Strafford County", March 1973.

2. **AQUIFER DISTRICT INCORRECTLY DELINEATED.** Where it is alleged that an area has been incorrectly delineated as an aquifer, or that an area not so designated meets the criteria for aquifer designation, the Planning Board shall determine whether the regulations contained herein apply.

The Planning Board shall make their judgement under this section only upon the determination by a qualified hydrogeologist(s) on the basis of additional on-site investigation or other suitable research that the information contained on the Aquifer map is incorrect. This evidence shall be acceptable only when presented in written form by said hydrogeologist to the Planning Board. Any necessary test well(s) or other investigation shall be conducted at the expense of the landowner or the developer.

C. RELATIONSHIP TO OTHER ZONES OR DISTRICTS

Where the Aquifer Conservation District is superimposed over another zoning district, the more restrictive regulations shall apply.

D. PERMITTED USES

1. **LOW DENSITY, RESIDENTIAL DEVELOPMENT** is permitted in the Aquifer Conservation District provided it meets the standards of Zone A as defined in Article IV. Multifamily units must meet the standards of Zone A.

No more than ten percent (10%) of a lot or tract in the Aquifer Conservation District shall be covered by pavement, roofing or materials impervious to water.

2. **ACCESSORY USES** are permitted as in Zone A (Article IV) provided that they also meet the requirements listed in this article under industrial/commercial uses.

3. **FARMING , GARDENING, NURSERY, FORESTRY AND GRAZING** are permitted provided that fertilizers, manure, pesticides, herbicides, and similar substances are used in accordance with applicable state and federal laws, including but not limited to New Hampshire RSA Chapters 149-D, 149-M, and 222.

Commercial use and temporary storage of inorganic fertilizers, herbicides, and pesticides are also subject to performance standards as outlined by the New Hampshire Department of Agriculture. Outdoor unenclosed storage of these materials is not permitted.

4. **RECREATIONAL ACTIVITIES** which pose no threat of contamination or pollution of groundwater and those which do not destroy the vegetative cover are permitted.

5. **INDUSTRIAL/COMMERCIAL USES** are permitted in Zone C provided that they do not store or dispose of hazardous or toxic materials on site and that they do not discharge process waters on site. No more than ten (10%) of a lot or tract in the Aquifer Conservation district shall be covered by pavement, roofing, or materials impervious to water.

E. PROHIBITED USES

1. **SUBSURFACE STORAGE OF PETROLEUM** or refined petroleum or refined petroleum products is prohibited in the Aquifer Conservation District. Existing underground tanks over 1100 gallons are subject to New Hampshire Water Supply and Pollution Control Commission regulations.

Existing underground tanks under 1100 gallons shall be inventoried within six (6) months of the adoption of this ordinance. All existing underground tanks shall be registered with the Board of Selectmen. Registration of the tanks must be renewed every five (5) years. Testing for leaking of existing underground tanks shall be begun within six (6) months of the adoption of this ordinance; the oldest tanks shall be tested first. The cost of the testing shall be shared jointly by the landowner and by the Town. Any tanks that fail a test must be pumped out and replaced with an above ground tank. Testing shall be done at five (5) year intervals under guidelines established by the Board of Selectmen.

2. **OUTDOOR STORAGE OF ROAD SALTS** or deicing chemicals is prohibited.

3. **DUMPING OF SNOW CONTAINING ROAD SALTS** or other deicing chemicals brought from outside the district is prohibited.

4. **SEPTAGE DISPOSAL** sites or waste lagoons are prohibited.

5. **SOLID WASTE DISPOSAL** areas (landfill or dump) are prohibited; stumppumps may be permitted on a site approved by the Planning Board and by special exception from the Board of Adjustment.

6. **STORAGE (ABOVE OR BELOW GROUND) DISCHARGE OR DISPOSAL OF HAZARDOUS OR TOXIC MATERIALS** are prohibited except as permitted for agricultural use.

7. **AUTOMOTIVE SERVICE** and repair shops, junk and salvage yards are prohibited.

8. **EARTH REMOVAL** where the excavation would substantially damage a known aquifer and/or the recharge area of an aquifer is prohibited.

F. CONFLICTING PROVISIONS

Whenever the regulations made under the authority hereof differ from those described by any statute, ordinance, or other regulations, that provision which imposes the greater restriction or the higher standard shall govern.

TRANSCRIPT

Serving Durham, Lee, Madbury, Newmarket, Newfields, Barrington, Stratham, Greenland, Newington

May 24, 1988

742-3735

P.O. Box 519, Dover, N.H.

Vol. 17 No. 21

25¢

On Protecting Our Open Land

DURHAM - Landowners from Durham, Lee, Madbury, and Newmarket who are interested in the possibility of giving or selling land easements to their town conservation commissions, learned all the facts and benefits at a meeting on May 12.

Held at the Hannah House Bed and Breakfast of Dick and Bea Dewey on Packers Falls Road, the meeting was attended by some 40 conservationists and landowners.

Speakers were Roberta Jordan, land agent for the Trust of New Hampshire Lands, and Judith Spang of the ad hoc committee on conservation lands.

Spang explained that the ad hoc committee was formed a year ago, with representatives of the conservation commissions of Lee, Madbury, Newmarket and Durham, the University of New Hampshire's Natural Areas Committee, and the Lamprey River Watershed Association. Representatives from the four towns were seeking to select open land to be protected. At the same time, UNH was concerned that their open lands might be cut off by development, forming habitat islands. Through a process of mapping currently protected land and remaining open lands, potential corridors could be seen which cross town boundaries. These were then prioritized, using both the conservation commission goals of each town and the selection criteria used by the Trust for N.H. Lands for their program. Selected corridors chosen included Crommett's Creek (Durham Point area), the Follett's Brook area in Durham, Newmarket and Lee (west of Packers Falls Road, between Wiswall and Lee Hook roads), and the Lamprey River watershed.

Spang explained why each had been selected. The Crommett's Creek area south of Dame Road completes a decade of work to acquire a band of land from Durham Point Road, near the landfill, to Great Bay, she said. It was chosen because it is also an invaluable wildlife habitat, and because land use along the creek will have a significant impact on the threatened water quality of Great Bay.

The Lamprey River was chosen for several reasons - its scenic beauty (it is listed on the National Inventory of Potential Wild and Scenic Rivers because of its scenic qualities); the purity of its water (the Lamprey River Watershed Association monitored it for two years and found it to be very clean, and it is Durham's secondary water supply); its importance for fish (named by the State Legislature and General Court as one of the most important rivers in the state for anadromous fish); and its relative lack of development. Spang pointed out that 'it is remarkable that a river of this quality can still be protected, in a county which is one of the fastest growing in the nation.' In the future, whatever land is left will be too expensive for towns to acquire, she said, while if it is saved now, the Lamprey will be a treasured recreational and scenic asset to the fully-developed towns. The Lamprey also empties into Great Bay, and impacts its water quality.

Spang went on to explain that the Follett's Brook area is valued for the size and diversity of marshes, upland woods and open fields, which provide a very rich habitat for wildlife, including wild turkey, deer, black bear and red-shouldered hawks. Follett's Brook is also the town of Newmarket's water supply. Where landowners have allowed public use, the area is enjoyed by snowmobilers, skiers, horseback riders and hunters.

Roberta Jordan was then introduced, and began by emphasizing that landowners are invited to participate in land conservation programs on a strictly voluntary basis. The towns have no intention of pressuring landowners within the selected areas who have other goals for their lands, she said.

'We're giving you the means to achieve some conservation goals that perhaps you've had,' Jordan continued, 'and now, with the Trust for N.H. Lands money, there's a way to be compensated at the same time.'

As a land agent for the Trust for N.H. Lands, Jordan's job is to inform landowners about land protection options, and about the Trust in particular. The Trust is a public/private partnership, with \$20 million allocated by the legislature for the acquisition of conservation land throughout the state, and \$3 million of privately-donated money for public information and administration.

Jordan described various advantages and mechanisms for landowners to protect their open land. The first consists of conservation easements, 'an alternative to giving land away,' she suggested, and, 'it stretches the resources we have.'

A conservation easement, Jordan said, essentially places a provision in the property deed that prevents any building of structures on the land, no matter who buys it in the future. Other non-development uses, such as farming or logging, can continue, however.

Conservation easements are flexible, used in a variety of situations. For example, they're used to protect river corridors. If you can interest a group of landowners along a single corridor in all donating an easement on the first 150' of river frontage, that can protect a stretch of river corridor for a long, long way. You don't have to give an easement over your whole property. In certain cases, easements can allow public use of your property, in certain cases, it won't - that's really up to the discretion of the landowner. The landowner may want to restrict certain parts of their land and leave parts out for their children or grandchildren. You can tailor it to meet your specific objectives.'

Jordan then explained three circumstances under which giving or selling conservation easements would benefit the landowner.

1. Estate Planning. 'In the last 10 years,' Jordan said, 'New Hampshire landowners have watched their land go from something they paid \$100 for 40 years ago to something that's now worth hundreds of thousands, sometimes millions of dollars. For families who want to keep that land in their family, it poses problems if a piece of land becomes so valuable that at the time of death it can't be passed on without incurring a federal estate tax.'

For landowners who wish to leave their property to their heirs, estate taxes can be very high, Jordan said, adding that on any property valued over \$600,000 - not uncommon on larger parcels in this region - the estate taxes can be up to 50% of the value over that limit. This may force the heirs to sell land to pay the taxes. Donating or selling an easement on certain portions of the land before it is inherited will keep the land in the family's ownership, but so reduce its taxable value that it becomes affordable from a tax standpoint.

'Obviously, if you donate that easement, you don't have that \$600,000 back in cash, subject again to taxes,' she concluded.

2. Income Taxes. On the other hand, Jordan pointed out, if a landowner decides to sell his land, he is faced with a capital gains tax on the amount his land has risen in value since he acquired it. On older properties in southern N.H., this increase in value is substantial. The capital gains tax can be reduced if the landowner makes a gift of one piece of his property (or sells it at a reduced rate) to the town, or places a conservation easement on it at the same time that he is selling or developing other parts of his land. In other words, he offsets the gains from selling some of his land by donations of other pieces. Developers can also take advantage of this means of tax reduction, Jordan said.

3. Property Taxes. Once land is under a conservation easement, it will be reduced in its assessed value, Jordan said.

'Even if current use should go out of business, it would still be taxed at its highest and best use, which would be at an open space rate.'

To receive Trust for N.H. Land money, the land or easement must go to either a town, the state, or a state agency, such as Fish and Game, Jordan explained. Other nonprofit groups, such as the Nature Conservancy, Audubon Society, and the Great Bay Research Reserve each have their own programs. She recommended that landowners contact their conservation commissions for details.

Jordan then described the Trust for N.H. Lands, which offers funds for towns to buy conservation land or easements. She pointed out that land considered to be of statewide importance can receive 100% of its value from the Trust. For lands of local value, the towns must provide 50% of the cost. This can be in the form of either town appropriations or the value of land which has been openly donated by landowners. If a landowner donates land, it can be used as the local match for the town to buy more land - plus the landowner gets all the income tax benefits of a charitable gift.

Jordan also described the application procedure for the Trust program. The Trust will determine whether the property in question has sufficient conservation value to be eligible for the program, she said, and since lands in the corridors were chosen using Trust criteria, they are likely candidates.

Some concern was expressed by those at the meeting that this program did not provide money for the necessary appraisal and surveying of land, and that this may fall on the landowner. However, several conservation commission members and townspeople in the group felt that the towns could be asked to provide for this expense. Both Jordan and the conservation commissions will help landowners with applications, the group was told.

Spang then pointed out that even if a landowner did not choose to donate or sell conservation easements, much could still be done to help in protecting these corridors: keeping existing vegetation along the water's edge, not fertilizing heavily down to the water or allowing animal waste to leach into it, considering the scenic view from the river when planning new structures, and encouraging neighbors to participate in the corridor protection effort.

Supporting land acquisition requests at town meetings is also an important way to help, Spang suggested. Above all, she said, landowners in the designated corridors are urged to contact their conservation commissions before changing the status of their property, or when doing their estate planning, so that their options could be explored further.

Jordan said she was available to meet with any landowners interested in protection of all or part of their land. She may be reached at 778-0504.

In closing, Spang said, 'There is a whole range of ways landowners can think about protecting their land, whether it's in the process of working with a developer, passing it on to their heirs in a way which will help to preserve parts of it (or all of it), or, if people are concerned that some land remains open for the future residents of the town, finding out about some of the mechanisms now available.'

When coffee was served after the formal discussion, property owners had an opportunity to discuss things further with Jordan and the conservation commission members present. The consensus seemed to be that many landowners were interested in finding out more, and that the concept of creating these conservation corridors was enthusiastically received.

9/13/89
(#s rose since then)

Public Support To date

As this study involves the two towns of Lee and Durham, this update reflects the status of both towns

- The Town of Lee selectmen voted unanimously to support the study on 9/13/89. Over 50% of Lamprey River landowners in Lee have returned signature cards as of 9/15/89, representing 4.5 miles of Lee river frontage.

Support is even more pronounced in Durham:

- Approximately 82% of Durham Lamprey River Landowners have returned signature cards as of 9/15/89. This represents 6 miles of Durham river frontage.
- The two real estate development companies with land along the Lamprey are supporting the study.

Summary: There is a clear majority of Durham Lamprey River landowners petitioning the Town Council to pass a resolution supporting the Wild and Scenic study.

TOWN OF LEE, NEW HAMPSHIRE

7 Mast Road

Lee, New Hampshire 03824

**OFFICE OF THE
SELECTMEN**

September 14, 1989

**TELEPHONE
603-859-5414**

Senator Gordon J. Humphrey
1 Eagle Square, Suite 507
Concord, NH 03301

Dear Senator Humphrey:

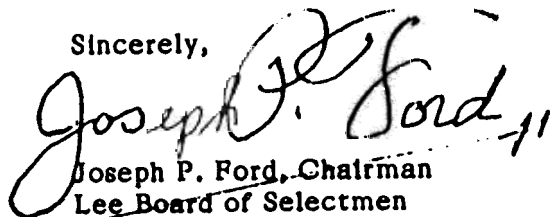
The Selectmen of Lee are deeply concerned about the threat posed to the Lamprey River by the proposed construction of a hydropower facility at Wiswall Dam, Durham. We believe this facility has the potential of causing serious and irreversible damage to the quality and character of riverine life, not only in Durham, but in Lee as well.

The Selectmen have long recognized that the Lamprey River provides our residents with many outstanding scenic, recreational, ecological, cultural, historical and other resource opportunities. In order to protect these resources, not only from the threat of hydropower development, but also from the long-term pressures of rapid growth in the Seacoast region, we urge you and other members of the New Hampshire delegation to work toward the enactment of legislation to designate the Lamprey River for study under the provisions of the National Wild and Scenic Rivers Act.

If such legislation is enacted, the Selectmen intend to work with the National Park Service and with other river towns to assist in the preparation of a local conservation plan to protect the Lamprey River and its environs for future generations.

We hope that you and your colleagues will do everything possible to assist us in this important effort.

Sincerely,


Joseph P. Ford, Chairman
Lee Board of Selectmen

JPF/jak



P

TOWN OF DURHAM
13-15 NEWMARKET ROAD
DURHAM, NH 03824-2898
603/868-5571

RESOLUTION NO. 89-12

A RESOLUTION TO SUPPORT A STUDY FOR THE LAMPREY RIVER UNDER
THE PROVISIONS OF THE NATIONAL WILD AND SCENIC RIVERS ACT

NOW COMES the Durham Town Council, the governing body of the Town of Durham, and resolves as follows:

WHEREAS, the majority of landowners along the Lamprey River in Durham, NH, have petitioned by signature the Durham Town Council to pass a resolution requesting members of Congress to enact legislation designating the Lamprey River for study under the provisions of the National Wild and Scenic Rivers Act; and

WHEREAS, the petitioners and the Durham Town Council recognize that the Lamprey River provides residents with many outstanding recreational, ecological, scenic, historic, and other resources; and

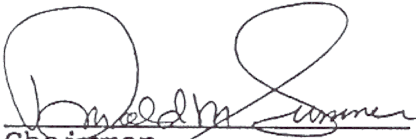
WHEREAS, local concern about this important river has increased due to a number of factors, including the proposed development of a hydroelectric facility, which may diminish or preclude local control of this resource; and

WHEREAS, the National Park Service, under the provisions of the National Wild and Scenic Rivers Act, can assist local communities in preparing a long-term protection plan for the Lamprey River which will rely on the use of existing state and local government authorities, as well as voluntary private landowner actions;

NOW, THEREFORE, BE IT RESOLVED that the Durham Town Council hereby urges members of Congress to enact legislation to designate that segment of the Lamprey River within the Durham Town boundaries for study under the provisions of the National Wild and Scenic Rivers Act; and

BE IT FURTHER RESOLVED that our intent is to protect the river and its important related adjacent land areas for future generations through the development of a locally prepared and controlled river management plan.

PASSED AND ADOPTED this Eighteenth day of September, 1989


Chairman
Durham Town Council

ATTEST:


Town Clerk

**THE LAMPREY RIVER,
LEE AND DURHAM, N.H.**

Subdivision: Riverfront is open common area

FARM

FARM

FARM

FARM

FARM

Marsh: Wildlife Area

Woodlands

Woodlands

Durham Public Drinking Water

Packard Falls: Recreational Area

Subdivision: 100' + Setbacks

DOE FARM: Town Recreation Area

Wildlife Area

Sculling Center

Newmarket Public Drinking Water Intake

Miswall Dam: Archeology Site

Wadleigh Falls Archeol. Site Breached Dam

Subdivision: Riverfront is open common area

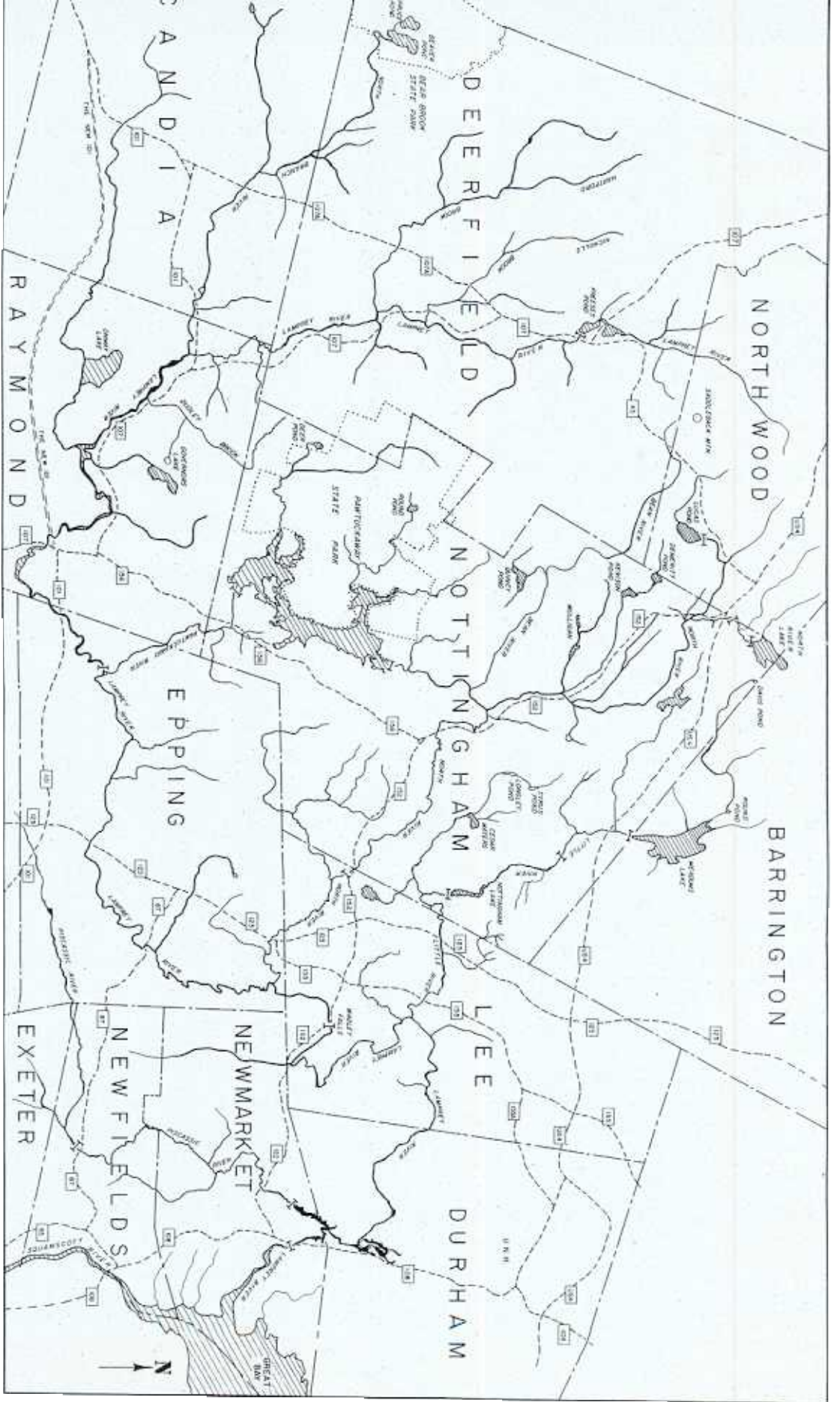
Lee

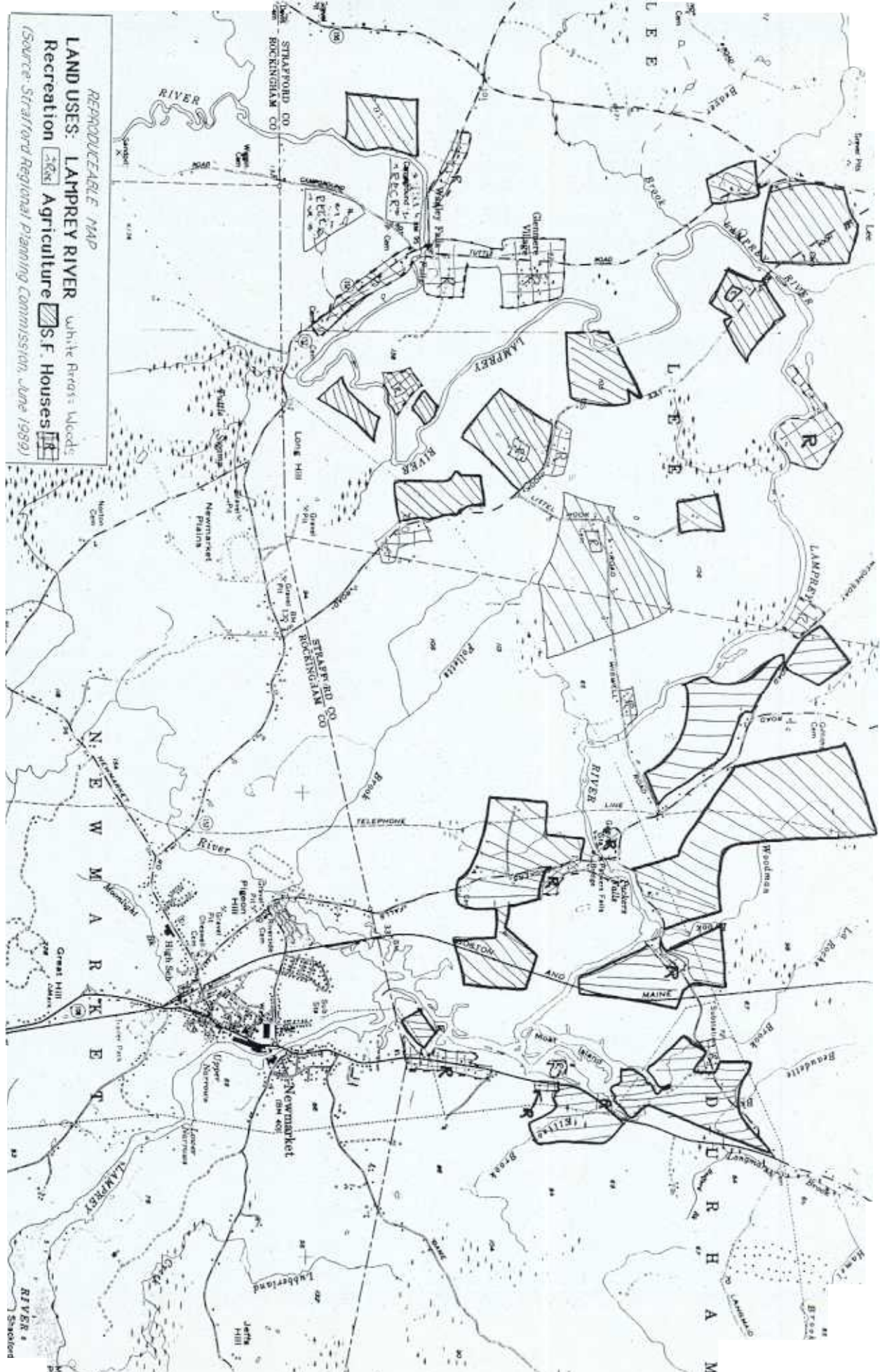
Durham

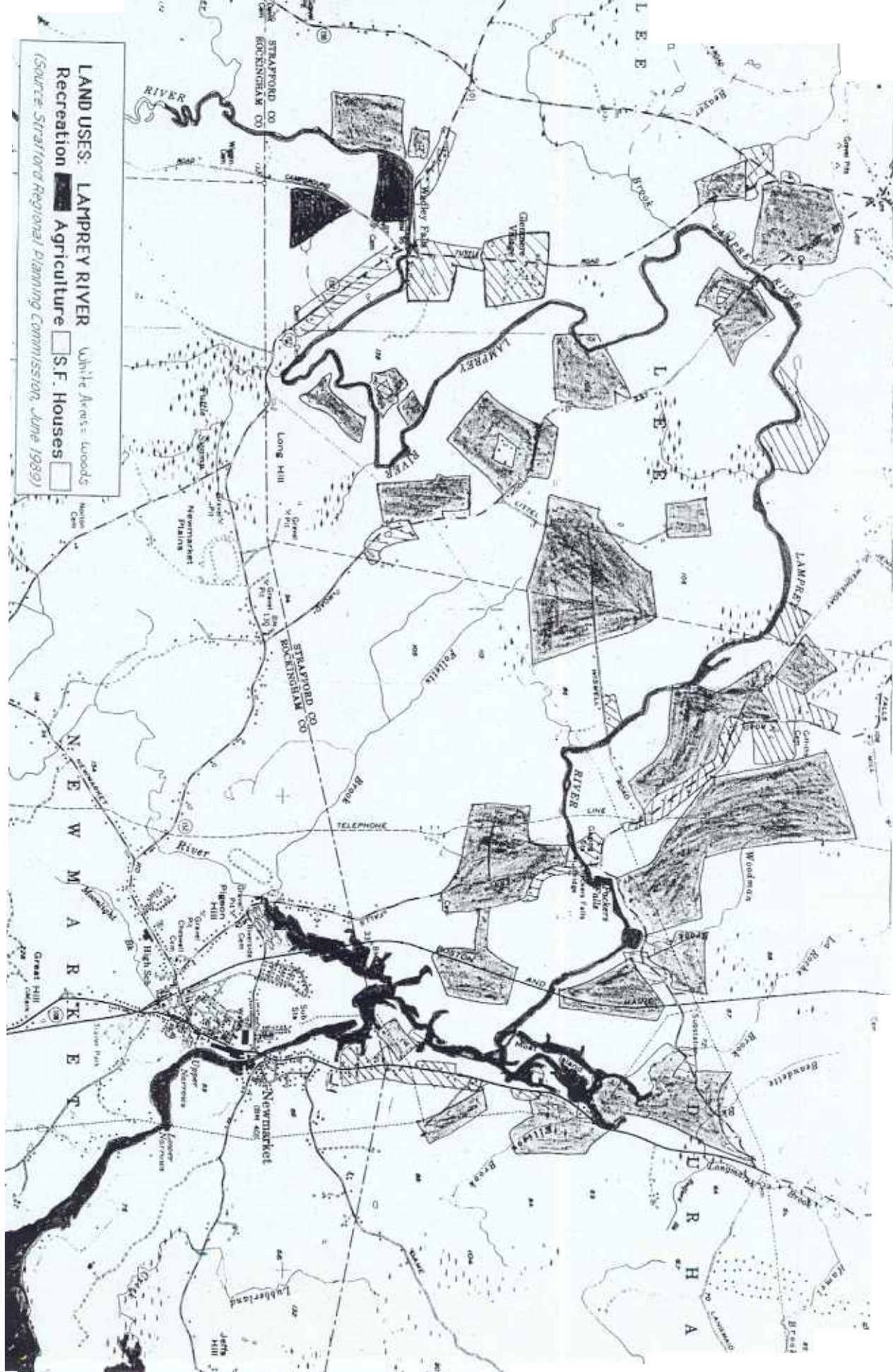
Stratford Co. Rockingham Co.

Great Bay

Archaeol. Site Breached Dam

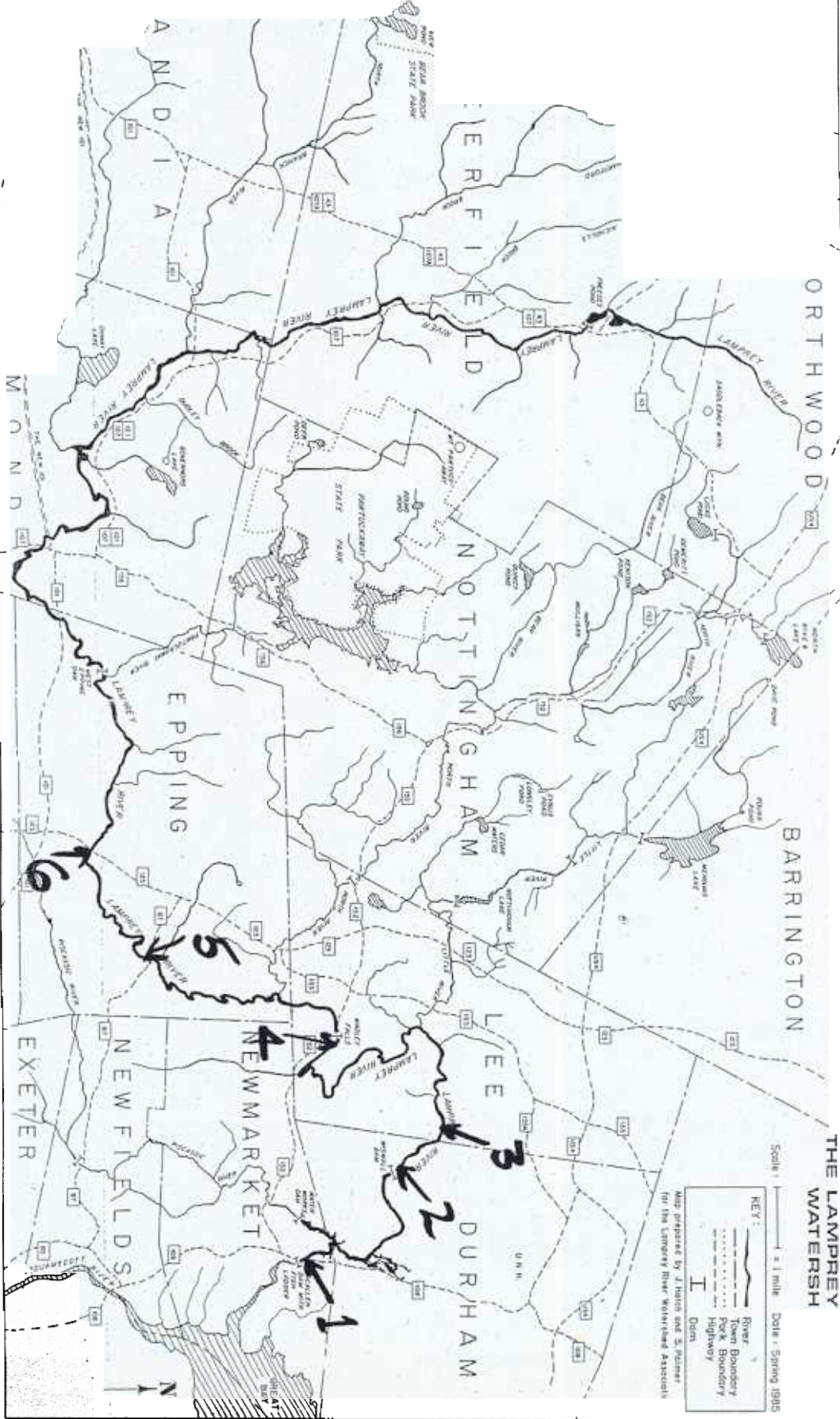


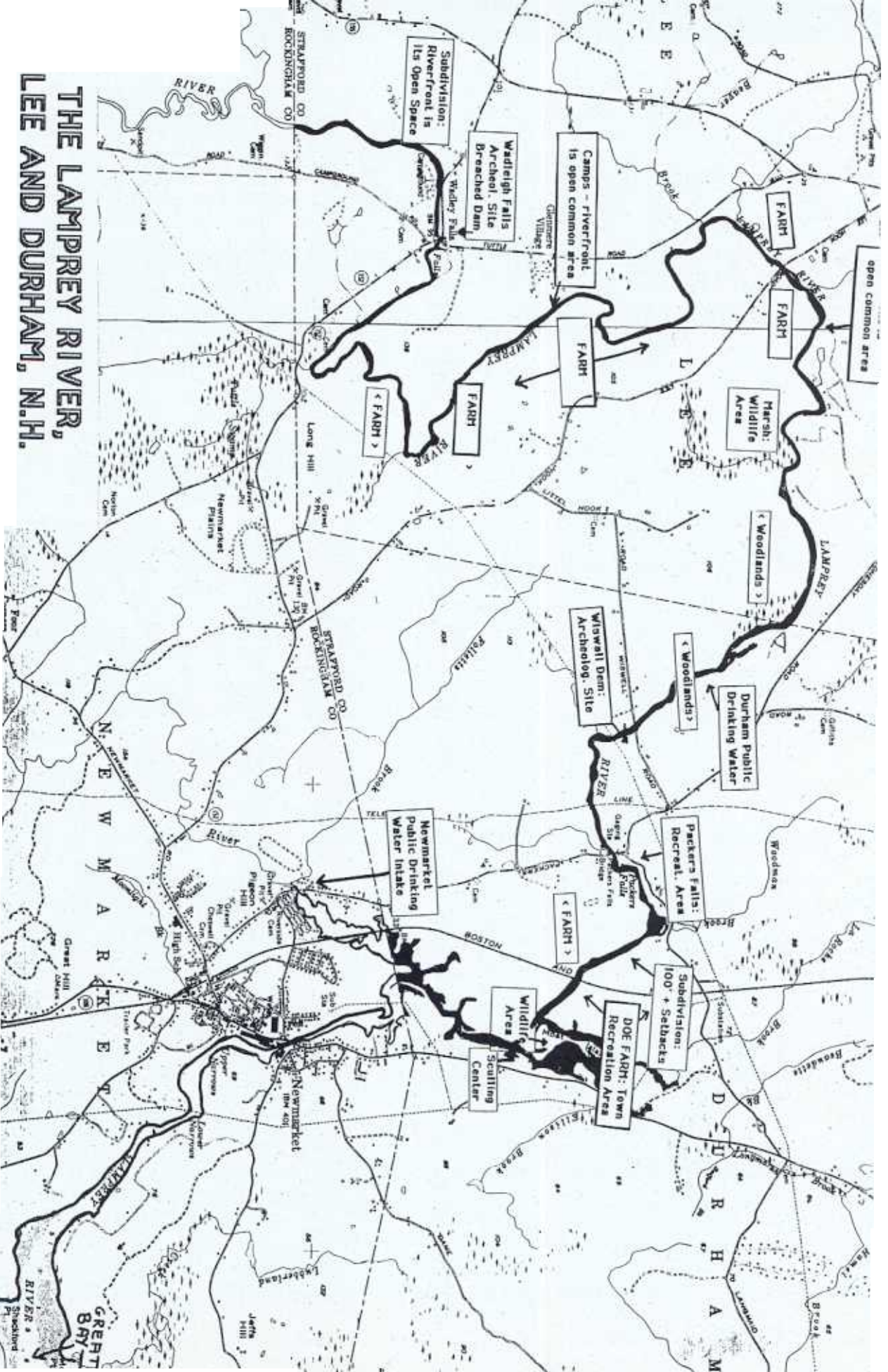




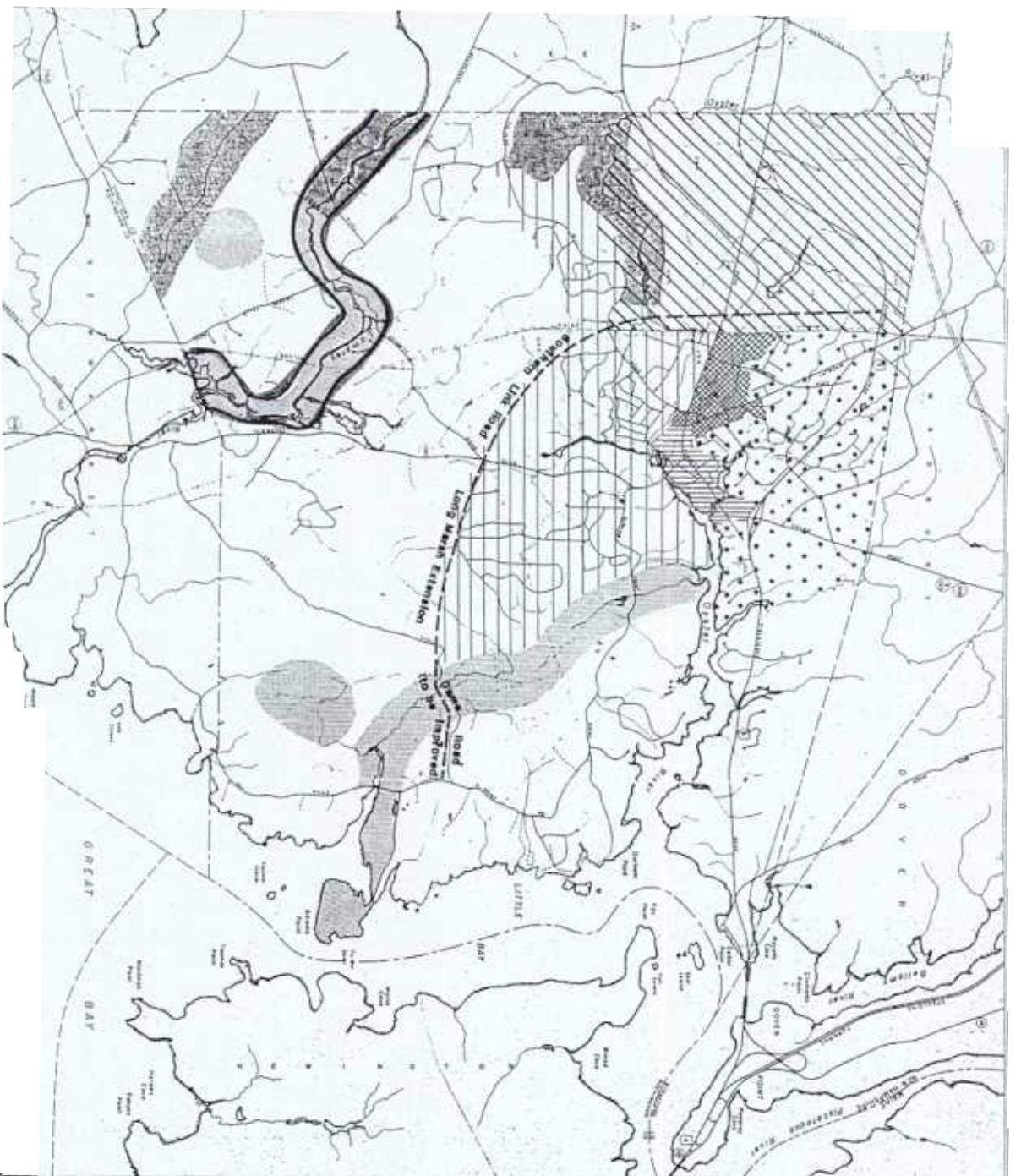
LAND USES: LAMPREY RIVER
Recreation Agriculture S.F. Houses White Areas: Woods
(Source: Strafford Regional Planning Commission, June 1989)

1987-88





**THE LAMPREY RIVER,
LEE AND DURHAM, N.H.**



TOWN OF
DURHAM
NEW HAMPSHIRE
DURHAM PLANNING BOARD
NEW HAMPSHIRE DEPARTMENT OF RESOURCES AND ECONOMIC DEVELOPMENT



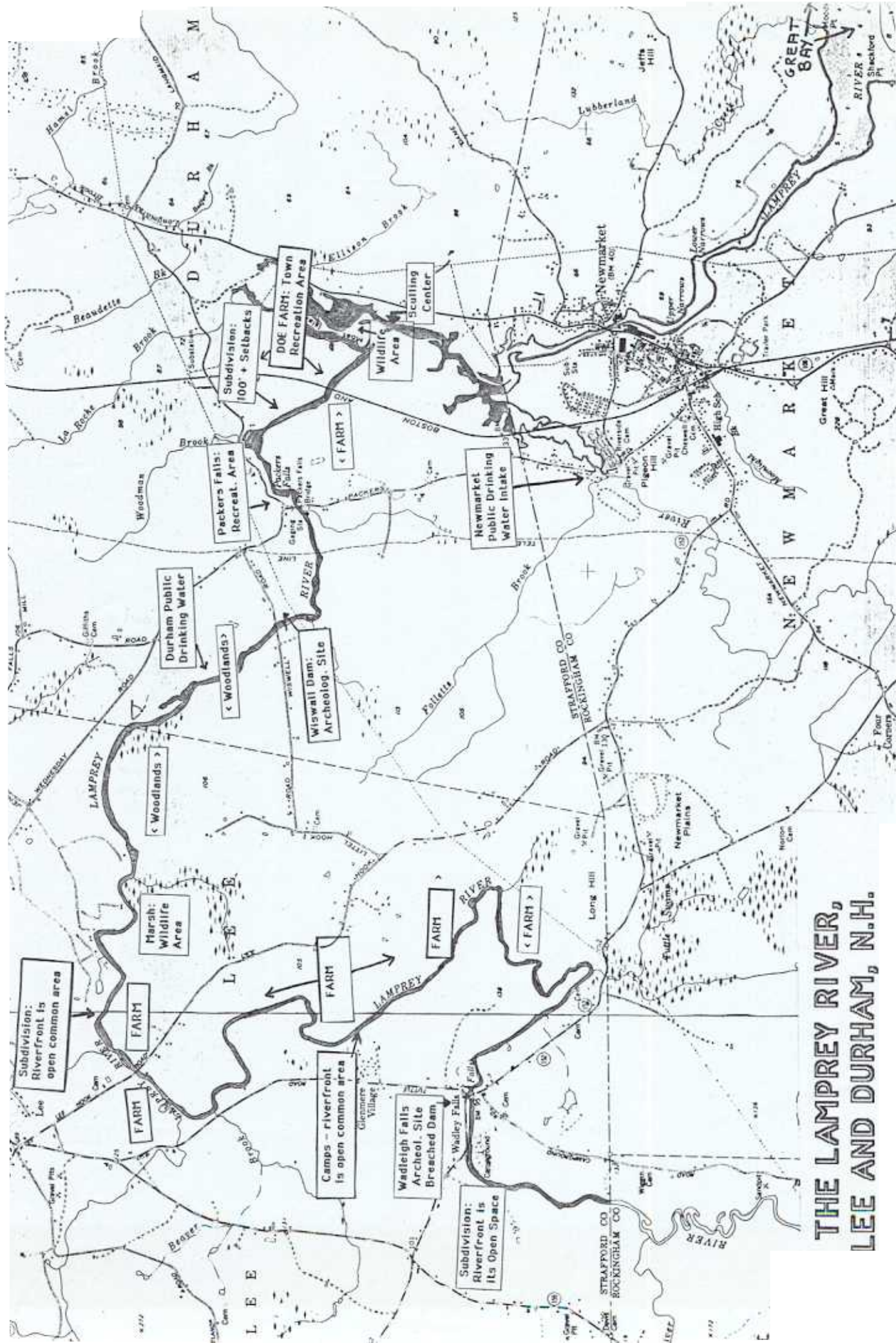
FUTURE LAND USE PLAN

LEGEND

- CENTRAL BUSINESS DISTRICT
- TRANSITION BUSINESS DISTRICT
- HIGH DENSITY RESIDENTIAL SINGLE FAMILY AND ELDERLY (WATER & SEWER)
- MEDIUM DENSITY RESIDENTIAL
- LOW DENSITY RESIDENTIAL COASTAL & RURAL
- WILDLIFE AREAS / RECREATIONAL CORRIDORS
- OFFICE/RESEARCH
- WATER SUPPLY / AQUIFER PROTECTION

ORIGINAL PREPARED BY:
THE PLANNING SERVICES GROUP INC.
CAMBRIDGE MASS. 1987

FRISTFROST LACONIA, NEW HAMPSHIRE
FRIST-FROST ASSOCIATES, P.C. OLDS FALLS, NEW YORK
CONSULTING ENGINEERS



THE LAMPREY RIVER, LEE AND DURHAM, N.H.

LAND USES: LAMPREY RIVER White Areas Woods
 Recreation ■ Agriculture ■ S.F. Houses ■
 (Source: Strafford Regional Planning Commission, June 1989)



LAMPREY RIVER WATERSHED ASSOC RIVER MONITORING SITES 98-88

